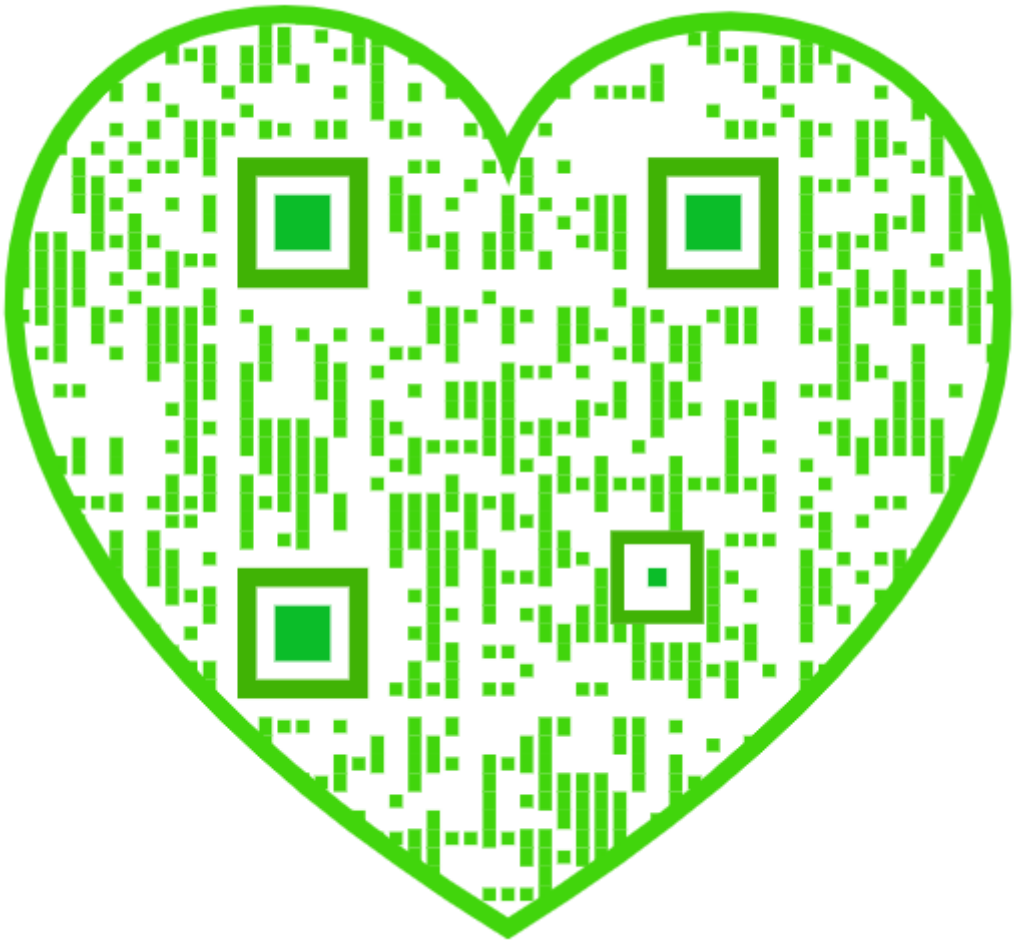

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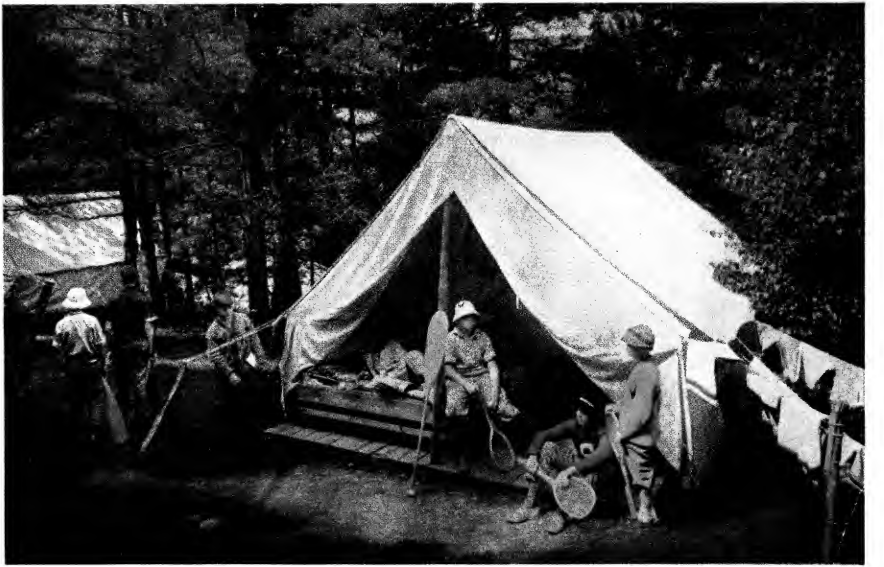

Photograph by Mary H. Northend

A Boy's Camp

The Library of Work and Play

OUTDOOR SPORTS AND GAMES

BY CLAUDE H. MILLER, PH.B.

GARDEN CITY NEW YORK
DOUBLEDAY, PAGE & COMPANY
1911

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OUTDOOR SPORTS AND GAMES

I

INTRODUCTORY

The human body a perfect machine—How to keep well—Outdoor sleeping—Exercise and play—Smoking—Walking

SUPPOSE you should wake up Christmas morning and find yourself to be the owner of a bicycle. It is a brand-new wheel and everything is in perfect working order. The bearings are well oiled, the nickel is bright and shiny and it is all tuned up and ready for use. If you are a careful, sensible boy you can have fun with it for a long time until finally, like the "One Hoss Shay" in the poem, it wears out and goes to pieces all at once. On the other hand, if you are careless or indifferent or lazy you may allow the machine to get out of order or to become rusty from disuse, or perhaps when a nut works loose you neglect it and have a breakdown on the road, or you may forget to oil the bearings and in a short time they begin to squeak and wear. If you are another kind of a boy, you may be careful enough about oiling and cleaning the wheel, but you may also be reckless and head-

strong and will jump over curbstones and gutters or ride it over rough roads at a dangerous rate of speed, and in this way shorten its life by abuse just as the careless boy may by neglect.

It is just so with the human body which, after all, is a machine too, and, more than that, it is the most wonderful and perfect machine in the world. With care it should last many years. With abuse or neglect it may very soon wear out. The boy who neglects his health is like the boy who allows the bearings on his wheel to become dry or the metal parts rusty. The chief difference is that when the bicycle wears out or breaks down we may replace the parts or even buy another machine, but when our health is injured, money will not restore it.

In order to keep well we must observe certain rules of health. By exercise we keep the working parts in good order. If we are lazy or indolent we are like the bicycle that is allowed to go to pieces from lack of use. If we are reckless and foolhardy we may injure some part of the delicate machinery from excessive exercise or strain.

Play is the most natural thing in the world but we must use judgment in our play. A boy or girl who is not allowed to play or who is restrained by too anxious parents is unhappy indeed. Nearly

all animals play. We know, for instance, that puppies, kittens, and lambs are playful. It is a perfectly natural instinct. By proper play we build up our bodies and train our minds. The healthy man never gets too old to play. He may not care to play marbles or roll hoops, but he will find his pleasure in some game or sport like tennis, golf, horseback riding, camping, fishing or hunting.

In this book we shall talk about some forms of play and recreation that are not strictly confined to children, but which we may still enjoy even after we have become grown men and women. We shall also talk about some children's games that some of the older readers may have outgrown. While we play we keep our minds occupied by the sport, and at the same time we exercise our muscles and feed our lungs and our bodies with oxygen.

It is unfortunate that in school or college athletics those who need exercise the most are often those who are physically unfitted to play on the school teams. In other words, we select our runners and jumpers and football players from among the stronger boys, while the weaker ones really need the benefit of the sport. Every boy should take part in school games when possible even if he is not as swift or as strong as some other boys.

It is very unmanly of one boy to make fun of another because he is weak or clumsy or unskilful. After all, the thing that counts and the thing that is most creditable is to make the most of our opportunities whatever they may be. If an undersized or timid boy becomes stronger or more brave because he joins in games and sports, he deserves a hundred times more credit than the big, strong boy whom nature has given a sturdy frame and good lungs and who makes a place on the school team without any real effort.

If we live a natural, open-air life we shall have but little need of doctors or medicine. Many of our grandmothers' notions on how to keep well have changed in recent years. Old-fashioned remedies made from roots and herbs have been almost completely replaced by better habits of life and common-sense ideas. We used to believe that night air was largely responsible for fevers and colds. Doctors now say that one of the surest ways to keep well is to live and sleep in the open air. In many modern houses the whole family is provided with outside sleeping porches with absolutely no protection from the outside air but the roof. I have followed the practice of sleeping in the open air for some time, and in midwinter without discomfort have had the

Photograph by Mary H. Northend

A Child's May Day Party

temperature of my sleeping porch fall to six degrees below zero. Of course it is foolish for any one to sleep exposed to rain or snow or to think that there is any benefit to be derived from being cold or uncomfortable. The whole idea of open-air sleeping is to breathe pure, fresh air in place of the atmosphere of a house which, under the best conditions, is full of dust and germs. If we become outdoor sleepers, coughs and colds will be almost unknown. General Sherman once wrote a letter in which he said that he did not have a case of cold in his entire army and he attributed it to the fact that his soldiers slept and lived in the open air.

One can almost tell a man who sleeps in the open by looking at him. His eye is clear and his cheek ruddy. There is no surer way to become well and strong than to become accustomed to this practice. Then you can laugh at the doctor and throw the medicine bottles away. In stating this I know that many parents will not agree with me, and will feel that to advise a boy to sleep in the open when the weather is stormy or extremely cold is almost like inviting him to his death. It is a fact just the same that every one would be healthier and happier if they followed this practice. In a few years I expect to see outdoor sleeping the rule rather than the

exception. Progressive doctors are already agreed on this method of sleeping for sick people. In some hospitals even delicate babies are given open-air treatment in midwinter as a cure for pneumonia. My own experience is that in the two years that I have been an outdoor sleeper, with the snow drifts sometimes covering the foot of the bed, with the wintry winds howling about my head in a northeaster, I have been absolutely free from any trace of coughs or colds. Thousands of others will give the same testimony. According to old-fashioned ideas such things would give me my "death of cold." It rarely happens that one begins the practice of sleeping out without becoming a firm believer in it.

One of the children of a friend in Connecticut who had just built a beautiful home was taken ill, and the doctor recommended that the child's bed be moved out on the porch. This was in December. The father also had his own bed moved out to keep the baby company. My friend told me that after the first night he felt like a changed man. He awoke after a refreshing sleep and felt better than he had in years. The whole family soon followed and all the beautiful bedrooms in the house were deserted. The baby got well and stayed well and

the doctor's visits are few and far between in that household.

By all means sleep in the open if you can. Of course one must have ample protection from the weather, such as a porch or piazza with a screen or shelter to the north and west. A warm room in which to dress and undress is also absolutely necessary. If your rest is disturbed by cold, as it will probably be until you become accustomed to it and learn the tricks of the outdoor sleeper, you simply need more covers. In winter, the bed should be made up with light summer blankets in place of sheets, which would become very cold. Use, as a night cap, an old sweater or skating cap. A good costume consists of a flannel shirt, woollen drawers, and heavy, lumberman's stockings. With such an outfit and plenty of covers, one can sleep out on the coldest night and never awaken until the winter's sun comes peeping over the hill to tell him that it is time to get up.

Besides fresh air, another important thing in keeping well is to eat slowly and to chew your food thoroughly. Boys and girls often develop a habit of rapid eating because they are anxious to get back to play or to school. Slow eating is largely a matter of habit as well, and while it may seem hard at

first it will soon become second nature to us. Remember to chew your food thoroughly. The stomach has no teeth. We have all heard of Mr. Horace Fletcher, that wonderful old man who made himself young again by chewing his food.

There is no fun in life unless we are well, and a sensible boy should realize that his parents' interest in him is for his own benefit. It may seem hard sometimes to be obliged to do without things that we want, but as a rule the judgment of the older people is better than our own. A growing boy will often eat too much candy or too many sweet things and then suffer from his lack of judgment. To fill our stomachs with indigestible food is just as foolish as it would be to put sand in the bearings of our wheel, or to interfere with the delicate adjustment of our watch until it refuses to keep time.

While we play, our muscles are developed, our lungs filled with fresh air and the whole body is made stronger and more vigorous. Some boys play too hard. Over-exertion will sometimes cause a strain on the delicate machinery of the body that will be very serious in after life. The heart is especially subject to the dangers of overstrain in growing boys. We are not all equally strong, and it is no discredit to a boy that he cannot run as far or lift as much as some

of his playmates or companions. You all remember the fable of the frog who tried to make himself as big as the ox and finally burst. The idea of exercise is not to try to excel every one in what you do, but to do your best without over-exertion. If a boy has a rugged frame and well developed muscles, it is perfectly natural that he should be superior in most sports to a boy that is delicate or undersized.

To be in good physical condition and to laugh at the doctor we must keep out of doors as much as possible. Gymnasium work of course will help us to build up our strength and develop our muscles, but skill in various acrobatics and gymnastic tricks does not give the clear eye and ruddy cheek of the person whose life is in the open air. Outdoor sports, like tennis, baseball, and horseback riding are far superior to chestweights or Indian clubs as a means of obtaining normal permanent development.

Parents who criticize school or college athletics often forget that the observance of the strict rules of training required from every member of a team is the very best way to keep a boy healthy in mind and body.

Tobacco and alcohol are absolutely prohibited, the kind of food eaten and the hours for retiring are compulsory, and a boy is taught not only to train his muscles but to discipline his mind. Before a

candidate is allowed to take active part in the sport for which he is training he must be "in condition," as it is called.

There are a great many rules of health that will help any one to keep well, but the best rule of all is to live a common-sense life and not to think too much about ourselves. Systematic exercises taken daily with setting up motions are very good unless we allow them to become irksome. All indoor exercise should be practised with as much fresh air in the room as possible. It is an excellent plan to face an open window if we practise morning and evening gymnastics.

There are many exercises that can be performed with no apparatus whatever. In all exercises we should practise deep regular breathing until it becomes a habit with us. Most people acquire a faulty habit of breathing and only use a small part of their total lung capacity. Learn to take deep breaths while in the fresh air. After a while it will become a habit.

Just how much muscle a boy should have will depend upon his physical make-up. The gymnasium director in one of our largest colleges, who has spent his whole life in exercise, is a small, slender man whose muscles are not at all prominent and yet they are

like steel wires. He has made a life-long study of himself and has developed every muscle in his body. From his appearance he would not be considered a strong man and yet some of the younger athletes weighing fifty pounds more than he, have, in wrestling and feats of strength, found that the man with the largest muscles is not always the best man.

There is one question that every growing boy will have to look squarely in the face and to decide for himself. It is the question of smoking. There is absolutely no question but that smoking is injurious for any one, and in the case of boys who are not yet fully grown positively dangerous. Ask any cigarette smoker you know and he will tell you *not to smoke*. If you ask him why he does not take his own advice he will possibly explain how the habit has fastened its grip on him, just as the slimy tentacles of some devil fish will wind themselves about a victim struggling in the water, until he is no longer able to escape. A boy may begin to smoke in a spirit of fun or possibly because he thinks it is manly, but more often it is because the "other fellers" are trying it too.

My teacher once gave our school an object lesson in habits which is worth repeating. He called one of the boys to the platform and wound a tiny piece

of thread around the boy's wrists. He then told him to break it, which the boy did very easily. The teacher continued to wind more thread until he had so many strands that the boy could break them only with a great effort and finally he could not break them at all. His hands were tied. Just so it is with a habit. The first, second, or tenth time may be easy to break, but we shall finally get so many tiny threads that our hands are tied. We have acquired a habit. Don't be a fool. Don't smoke cigarettes.

Walking is one of the most healthful forms of exercise. It may seem unnecessary to devote much space to a subject that every one thinks they know all about, but the fact is that, with trolley cars, automobiles, and horses, a great many persons have almost lost the ability to walk any distance. An excellent rule to follow if you are going anywhere is this: If you have the time, and the distance is not too great, walk. In recent years it has been the practice of a number of prominent business and professional men who get but little outdoor exercise to walk to and from their offices every day, rain or shine. In this way elderly men will average from seven to ten miles a day and thus keep in good condition with no other exercise.

It is very easy to cultivate the street car habit, and some boys feel that they must ride to and from school even if it is only a few blocks or squares. We have all read of the old men who are walking across the country from New York to California and back again and maintaining an average of forty miles a day. There is not a horse in the world that would have the endurance to go half the distance in the same time and keep it up day after day. For the first week or ten days the horse would be far ahead but, like the fable of the hare and the tortoise, after a while the tortoise would pass the hare and get in first.

In walking for pleasure, avoid a rambling, purposeless style. Decide where you are going and go. Walk out in the country if possible and on roads where the automobiles will not endanger your life or blow clouds of dust in your face. Never mind the weather. One rarely takes cold while in motion. To walk comfortably we should wear loose clothing and old shoes. Walking just for the sake of exercise can easily become a tiresome occupation, but the active mind can always see something of interest, such as wild flowers, gardens, and all the various sides of nature study in the country, and people, houses and life in the city.

A tramping vacation of several days furnishes a fine opportunity to see new scenes and to live economically, but near a city you may have difficulty in persuading the farm-wife where you stop that you are not a tramp who will burn the house in the night. If you intend to live by the wayside, the surest way to inspire confidence is to show in advance that you have money to pay for your accommodations. Also try to avoid looking like a tramp, which is quite different from looking like a tramper.

There seems to be a great difference of opinion on the question of how fast one can walk. The popular idea is "four miles an hour" but any one who has tried to cover a mile every fifteen minutes will testify that such a rate of speed is more like a race than a walk and that it will require great physical exertion to maintain it for any considerable distance. An eighteen or twenty-mile walk is about all the average boy should attempt in a day, and this is allowing the full day for the task from early morning until sunset.

Short and frequent rests are much better than long stops, which have a tendency to stiffen the muscles. The walker on a long tramp must pay especial attention to the care of his feet. They should be bathed frequently in cold water to which a little

alum has been added. A rough place or crease in the stocking will sometimes cause a very painful blister.

Mountain climbing is a very interesting branch of walking. It is sometimes very dangerous as well and in such cases should only be attempted under the guidance of some one familiar with the neighbourhood. For rough climbing our shoes should be provided with iron hob nails. Steel nails often become very slippery and will cause a bad fall on rocks.

Cross-country running and hare and hound chases are much more common in England than in America. Our runners as a rule excel in the sprints and short dashes, although in the recent Olympic sports we have shown that our trained athletes are the equal of the world in nearly all branches of sport.

In many of the English schools it is a regular part of the school work for the teacher to organize hare and hound chases. The hares are given a start of several minutes and leave a trail by means of bits of paper or confetti, which they carry in a bag. In this kind of running the object to be sought is not so much speed as endurance. An easy dog trot with deep regular breathing will soon give us our second wind, when we can keep on for a long distance.

After any kind of physical exertion, especially when we are in a perspiration, care must be exercised not to become chilled suddenly. A rub down with a rough towel will help to prevent soreness and stiff muscles. The lameness that follows any kind of unusual exercise is an indication that certain muscles have been brought into use that are out of condition. A trained athlete does not experience this soreness unless he has unduly exerted himself, and the easiest way to get over it is to do more of the same kind of work until we are in condition.

II

THE BOY SCOUTS OF AMERICA

Headquarters — Purpose — Scout law — How to form a patrol of scouts — Organization of a troop — Practical activities for scouts — A scout camp — Model programme of a Sir R. S. S. Baden-Powell scout camp

THE Boy Scout movement that has recently been introduced both in England and America with such wonderful success is so closely related to nearly all branches of outdoor recreation and to the things that boys are interested in that this book would be incomplete without mention of the object and purposes of this organization. It is a splendid movement for the making of better citizens, and it cannot be too highly recommended.

The Boy Scouts of America is a permanent organization, and it has its headquarters at 200 Fifth Avenue, New York City. From the central office, patrols and troops are being formed all over the United States. Any information with reference

to the movement may be obtained by applying to this office.

Through the courtesy of the managing secretary, Mr. John L. Alexander, certain facts are presented concerning the organization, which are obtained from their published literature, for which due credit is hereby given.

The Boy Scouts is an organization the purpose of which is character-building for boys between the ages of twelve and eighteen. It is an effort to get boys to appreciate the things about them and to train them in self-reliance, manhood, and good citizenship. It is "peace-scouting" these boys engage in, living as much as possible out of doors; camping, hiking and learning the secrets of the woods and fields. The movement is not essentially military, but the military virtues of discipline, obedience, neatness and order are scout virtues. Endurance, self-reliance, self-control and an effort to help some one else are scout objectives. Every activity that lends itself to these aims is good scoutcraft.

The Boy Scouts were started in England by Gen. Sir Robert Baden-Powell. He was impressed with the fact that 46 per cent. of the boys of England were growing up without any knowledge of useful occupations, and wanted to do something

that would help the boy to become a useful citizen. He emphatically stated that his intention was not the making of soldiers. In his work. General Baden-Powell has touched the boy's life in all its interests and broadened a boy's outlook by the widest sort of activities. In two and a half years over half a million Boy Scouts have been enrolled, and twenty thousand of these have been in parade at one time in London.

The scout idea has sprung up spontaneously all over America. In Canadian cities the Boy Scouts number thousands. In the United States, towns and cities are being swept by the idea. Gangs of boys are to be seen on every hand, doing their best at scoutcraft, "doing a good turn every day to some one," and getting fun out of it. Prominent business men and educators are behind the movement.

The aim of the Boy Scouts is to supplement the various existing educational agencies, and to promote the ability in boys to do things for themselves and others. The method is summed up in the term "scoutcraft" and is a combination of observation, deduction and handiness — or the ability to do. Scoutcraft consists of "First Aid," Life Saving, Tracking, Signalling, Cycling, Nature Study, Sea-

manship and other instruction. This is accomplished in games and team play and in pleasure, not work, for the boy. The only equipment it needs is the out-of-doors, a group of boys and a leader.

Before he becomes a scout, a boy must take the scouts' oath thus:

"On my honour, I promise that I will do my best, 1. To do my duty to God and my country. 2. To help other people at all times. 3. To obey the scout law."

When taking this oath the scout will stand holding his right hand raised level with his shoulder, palm to the front, thumb resting on the nail of the little finger, and the other three fingers upright pointing upward. This the scouts' salute and secret sign.

When the hand is raised shoulder high it is called "the half salute."

When raised to the forehead it is called "the full salute."

The three fingers held up (like the three points on the scouts' badge) remind him of his three promises in the scouts' oath.

There are three classes of scouts. A boy on joining the Boy Scouts must pass a test in the following points before taking the oath:

Know the scouts' laws and signs and the salute.

Know the composition of the national flag and the right way to fly it.

Tie four of the following knots: Reef, sheet bend, clove hitch, bowline, middleman's, fisherman's, sheep-shank.

He then takes the scouts' oath and is enrolled as a tenderfoot and is entitled to wear the buttonhole badge.

A SECOND-CLASS SCOUT

Before being awarded a second-class scout's badge, a boy must pass the following tests:

1. Have at least one month's service as a tenderfoot.
2. Elementary first aid bandaging.
3. Signalling. Elementary knowledge of semaphore or Morse alphabet.
4. Track half a mile in twenty-five minutes, or if in a town describe satisfactorily the contents of one store window out of four, observed for one minute each.
5. Go a mile in twelve minutes at "scouts' pace."
6. Lay and light a fire using not more than two matches.
7. Cook a quarter of a pound of meat and two

potatoes without cooking utensils other than the regulation billy.

8. Have at least twenty-five cents in the savings bank.

9. Know the sixteen principal points of the compass.

FIRST-CLASS SCOUT

Before being awarded a first-class scout's badge, a scout must pass the following test in addition to the tests laid down for a second-class scout:

1. Swim fifty yards. (This may be omitted where the doctor certifies that bathing is dangerous to the boy's health).

2. Must have at least fifty cents in the savings bank.

3. Signalling. Send and receive a message either in semaphore or Morse, sixteen letters per minute.

4. Go on foot or row a boat alone to a point seven miles away and return again, or if conveyed by any vehicle or animal go a distance of fifteen miles and back and write a short report on it. It is preferable that he should take two days over it.

5. Describe or show the proper means for saving life in case of two of the following accidents: Fire,

drowning, runaway carriage, sewer gas, ice breaking, or bandage an injured patient or revive an apparently drowned person.

6. Cook satisfactorily two of the following dishes as may be directed: Porridge, bacon, hunter's stew; or skin and cook a rabbit or pluck and cook a bird. Also "make a damper" of half a pound of flour or a "twist" baked on a thick stick.

7. Read a map correctly and draw an intelligent rough sketch map. Point out a compass direction without the help of a compass.

8. Use an axe for felling or trimming light timber: or as an alternative produce an article of carpentry or joinery or metal work, made by himself satisfactorily.

9. Judge distance, size, numbers and height within 25 per cent. error.

10. Bring a tenderfoot trained by himself in the points required of a tenderfoot.

THE SCOUTS' LAW

1. A scout's honour is to be trusted. If a scout were to break his honour by telling a lie, or by not carrying out an order exactly, when trusted on his honour to do so, he may be directed to hand over his scouts' badge and never to wear it

again. He may also be directed to cease to be a scout.

2. A scout is loyal to his country, his officers, his parents and his employers. He must stick to them through thick and thin against any one who is their enemy or who even talks badly about them.

3. A scout's duty is to be useful and to help others. He must be prepared at any time to save life or to help injured persons, and he must try his best to do a good turn to somebody every day.

4. A scout is a friend to all and a brother to every other scout, no matter to what social class the other belongs.

5. A scout is courteous, especially to women, children, old people, invalids, and cripples. And he must never take a reward for being courteous.

6. A scout is a friend to animals. Killing an animal for food is allowable.

7. A scout obeys orders of his parents, patrol leader, or scout master without question.

8. A scout smiles and whistles under all circumstances.

9. A scout is thrifty and saves every penny he can and puts it into the bank.

The scout master is the adult leader of a troop. A troop consists of three or more patrols. The scout

master may begin with one patrol. He must have a deep interest in boys, be genuine in his own life, have the ability to lead and command the boys' respect and obedience, and possess some knowledge of a boy's ways. He need not be an expert on scoutcraft. The good scout master will discover experts for the various activities.

To organize a patrol, get together seven or more boys, explain to them the aims of the Boy Scouts, have them elect a leader and corporal from their own number and take the scout oath as tenderfeet. To organize a local committee, call together the leading men of a town or city, teachers, business men, professional men, and all who are interested in the proper training of boys, for a committee to superintend the development of the scout movement.

There are a number of divisions to scouting depending upon the place where the boys live and upon their opportunities. For instance, to obtain:

An Ambulance Badge: A scout must know: The fireman's lift. How to drag an insensible man with ropes. How to improvise a stretcher. How to fling a life-line. The position of main arteries. How to stop bleeding from vein or artery, internal or external. How to improvise splints and to diagnose and bind fractured limb. The Schafer method of artificial respiration. How

to deal with choking, burning, poison, grit in eye, sprains and bruises, as the examiners may require. Generally the laws of health and sanitation as given in "Scouting for Boys," including dangers of smoking, in continence, want of ventilation, and lack of cleanliness.

Aviator: A scout must have a knowledge of the theory of æroplanes, ball balloons and dirigibles, and must have made a working model of an æroplane or dirigible that will fly at least twenty-five yards. He must also have a knowledge of the engines used for æroplanes and dirigibles.

Bee-farmer: A scout must have a practical knowledge of swarming, hiving, hives, and general apiculture, including a knowledge of the use of artificial combs, etc.

Blacksmith: A scout must be able to upset and weld a one-inch iron rod, make a horseshoe, know how to tire a wheel, use a sledge hammer and forge, shoe a horse correctly, and rough-shod a horse.

Bugler: A scout must be able to sound properly on the bugle the Scouts' Rally and the following army calls: Alarm, charge, orderlies (ord. corpls.), orders, warning for parade, quarter bugle, fall in, dismiss, rations, first and second dinner calls (men's), reveille, last post, lights out.

Carpenter: A scout must be able to shoot and

glue a four-foot straight joint, make a housing, tenon and mortise, and halved joint, grind and set a chisel and plane iron, make a 3 ft. by 1 ft. 6 in., by 1 ft. by 6 ft. dovetailed locked box, or a table or chair.

Clerk: A scout must have the following qualifications: Good handwriting and hand printing. Ability to use typewriting machine. Ability to write a letter from memory on the subject given verbally five minutes previously. Knowledge of simple bookkeeping. Or, as alternative to typewriting, write in shorthand from dictation at twenty words a minute as minimum.

Cook: A scout must be able to light a fire and make a cook-place with a few bricks or logs; cook the following dishes: Irish stew, vegetables, omelet, rice pudding, or any dishes which the examiner may consider equivalent; make tea, coffee, or cocoa; mix dough and bake bread in oven; or a "damper" or "twist" (round steak) at a camp fire; carve properly, and hand plates and dishes correctly to people at table.

Cyclist: A scout must sign a certificate that he owns a bicycle in good working order, which he is willing to use in the scouts' service if called upon at any time in case of emergency. He must be able to ride his bicycle satisfactorily, and repair punctures,

etc. He must be able to read a map, and repeat correctly a verbal message. On ceasing to own a bicycle the scout must be required to hand back his badge.

Dairyman: A scout must understand: Management of dairy cattle; be able to milk, make butter and cheese; understand sterilization of milk, safe use of preservatives, care of dairy utensils and appliances.

Electrician: A scout must have a knowledge of method of rescue and resuscitation of persons insensible from shock. Be able to make a simple electro-magnet, have elementary knowledge of action of simple battery cells, and the working of electric bells and telephone. Understand and be able to remedy fused wire, and to repair broken electric connections.

Engineer: A scout must have a general idea of the working of motor cars and steam locomotives, marines, internal combustion and electric engines. He must also know the names of the principal parts and their functions; how to start, drive, feed, stop, and lubricate any one of them chosen by the candidate.

Farmer: A scout must have a practical knowledge of ploughing, cultivating, drilling, hedging and

draining. He must also have a working knowledge of farm machinery, hay-making, reaping, heading and stacking, and a general acquaintance with the routine seasonal work on a farm, including the care of cattle, horses, sheep and pigs.

Fireman: A scout must know how to give the alarm to inhabitants, police, etc. How to enter burning buildings. How to prevent spread of fire. Use of hose, unrolling, joining up, hydrants, use of nozzle, etc. The use of escape, ladders, and shutes; improvising ropes, jumping sheets, etc. The fireman's lift, how to drag patient, how to work in fumes, etc. The use of fire extinguishers. How to rescue animals. How to salve property, climb and pass buckets. "Scrum" to keep back crowd.

First Aid to Animals: A scout must have a general knowledge of the anatomy of domestic and farm animals, and be able to describe treatment and symptoms of the following: Wounds, fractures and sprains, exhaustion, choking, lameness. He must understand shoeing and shoes, and must be able to give a drench for colic.

Gardener: A scout must dig a piece of ground not less than twelve feet square, know the names of a dozen plants pointed out in an ordinary garden, understand what is meant by pruning, grafting

and manuring, plant and grow successfully six kinds of vegetables or flowers from seeds or cuttings, cut and make a walking stick, or cut grass with scythe under supervision.

Handyman: A scout must be able to paint a door or bath, whitewash a ceiling, repair gas fittings, tap washers, sash lines, window and door fastenings, replace gas mantles and electric light bulbs, hang pictures and curtains, repair blinds, fix curtain and portière rods, blind fixtures, lay carpets, mend clothing and upholstery, do small furniture and china repairs, and sharpen knives.

Horseman: A scout must know how to ride at all paces, and to jump an ordinary fence on horseback. How to saddle and bridle a horse correctly. How to harness a horse correctly in single or double harness, and to drive. How to water and feed, and to what amount. How to groom his horse properly. The evil of bearing and hame reins and ill-fitting saddlery. Principal causes and remedies of lameness.

Interpreter: A scout must be able to carry on a simple conversation, write a simple letter on subject given by examiner, read and translate a passage from a book or newspaper, in either Esperanto or any language that is not that of his own country.

Leather Worker: A scout must have a knowledge

of tanning and curing, and either (*a*) be able to sole and heel a pair of boots, sewn or nailed, and generally repair boots and shoes: or (*b*) be able to dress a saddle, repair traces, stirrup leathers, etc., and know the various parts of harness.

Marksman: A scout must pass the following tests for miniature rifle shooting from any position: N. R. A. Standard Target to be used. Twenty rounds to be fired at 15 or 25 yards. Highest possible, 100 points. A scout gaining 60 points or over to be classified as marksman. Scoring: Bull's-eye, 5 points; inner, 4 points; magpie, 3 points; outer 2 points. Also: Judge distance on unknown ground: Five distances under 300 yards, 5 between 300 and 600 yards, with not more than an error of 25 per cent. on the average.

Master-at-arms: A scout must attain proficiency in two out of the following subjects: Single-stick, quarter-staff, fencing, boxing, jiu-jitsu and wrestling.

Missioner: The qualifications are: A general elementary knowledge of sick-nursing; invalid cookery, sick-room attendance, bed-making, and ventilation. Ability to help aged and infirm.

Musician: A scout must be able to play a musical instrument correctly other than triangle, and to read

simple music. Or to play properly any kind of musical toy, such as a penny whistle, mouth-organ, etc., and sing a song.

Pathfinder: It is necessary to know every lane, by-path, and short cut for a distance of at least two miles in every direction around the local scouts' headquarters in the country, or for one mile if in a town, and to have a general knowledge of the district within a five-mile radius of his local headquarters, so as to be able to guide people at any time, by day or night. To know the general direction of the principal neighbouring towns for a distance of twenty-five miles, and to be able to give strangers clear directions how to get to them. To know, in the country, in the two-mile radius, generally, how many hayricks, strawricks, wagons, horses, cattle, sheep and pigs there are on the different neighbouring farms; or, in a town, to know in a half-mile radius what livery stabling, corn chandlers, forage merchants, bakers, butchers, there are. In town or country to know where are the police stations, hospitals, doctors, telegraph, telephone offices, fire engines, turncocks, blacksmiths and job-masters or factories, where over a dozen horses are kept. To know something of the history of the place, or of any old buildings, such as the

church, or other edifice. As much as possible of the above information is to be entered on a large scale map.

Photographer: A scout must have a knowledge of the theory and use of lenses, and the construction of cameras, action of developers. He must take, develop and print twelve separate subjects, three interiors, three portraits, three landscapes and three instantaneous photographs.

Pioneer: A scout must have extra efficiency in pioneering in the following tests, or suitable equivalents: Fell a nine-inch tree or scaffolding pole neatly and quickly. Tie eight kinds of knots quickly in the dark or blindfolded. Lash spars properly together for scaffolding. Build model bridge or derrick. Make a camp kitchen. Build a hut of one kind or another suitable for three occupants.

Piper: A scout must be able to play a march and a reel on the pipes, to dance the sword-dance, and must wear kilt and Highland dress.

Plumber: A scout must be able to make wiped and brazed joints, to cut and fix a window pane, repair a burst pipe, mend a ball or faucet tap, and understand the ordinary hot and cold water system of a house.

Poultry Farmer: A scout must have a good knowl-

edge of incubators, brooders, sanitary fowl-houses and coops and runs; also of rearing, feeding, killing, and dressing birds for market; also he must be able to pack birds and eggs for market.

Printer: A scout must know the names of different types and paper sizes. Be able to compose by hand or machine, understand the use of hand or power printing machines. He must also print a handbill set up by himself.

Seaman: A scout must be able to tie eight knots rapidly in the dark or blindfolded. Splice ropes, fling a rope coil. Row and punt a boat single-handed, and punt with pole, or scull it over the stern. Steer a boat rowed by others. Bring the boat properly alongside and make it fast. Box the compass. Read a chart. State direction by the stars and sun. Swim fifty yards with trousers, socks, and shirt on. Climb a rope or pole of fifteen feet, or, as alternative, dance the hornpipe correctly. Sew and darn a shirt and trousers. Understand the general working of steam and hydraulic winches, and have a knowledge of weather wisdom and knowledge of tides.

Signaller: A scout must pass tests in both sending and receiving in semaphore and Morse signalling by flag, not fewer than twenty-four letters per

minute. He must be able to give and read signals by sound. To make correct smoke and flame signals with fires. To show the proper method of signalling with the staff.

Stalker: A scout must take a series of twenty photographs of wild animals or birds from life, and develop and print them. Or, alternately, he must make a collection of sixty species of wild flowers, ferns, or grasses, dried and mounted in a book and correctly named. Or, alternately, he must make coloured drawings of twenty flowers, ferns or grasses, or twelve sketches from life of animals and birds. Original sketches, as well as the finished pictures, to be submitted. Or, alternately he must be able to name sixty different kinds of animals, insects, reptiles, or birds in a museum or zoological garden, or from unnamed coloured plates, and give particulars of the lives, habits, appearance and markings of twenty of them.

Starman: A scout must have a general knowledge of the nature and movements of the stars. He must be able to point out and name six principal constellations. Find the north by means of other stars than the Pole Star in case of that star being obscured by clouds, etc., and tell the hour of the night by the stars or moon. He must have a general knowl-

edge of the positions and movements of the earth, sun and moon, and of tides, eclipses, meteors, comets, sun spots, planets.

Surveyor: A scout must map correctly, from the country itself, the main features of a half a mile of road, with 440 yards each side, to a scale of two feet to the mile, and afterward re-draw same map from memory. Measure the heights of a tree, telegraph pole and church steeple, describing method adopted. Measure width of a river, and distance apart of two objects a known distance away and unapproachable. Be able to measure a gradient, contours, conventional signs of ordnance survey and scales.

Swimming and Life Saving: A scout must be able to dive and swim fifty yards with clothes on (shirt, trousers, socks as minimum). Able to fling and use life-line or life-buoy. Able to demonstrate two ways of rescue of drowning person, and revival of apparently drowned.

THE PATROL

The simplest way to form a patrol of scouts is to call together a small group of boys over twelve years of age. A simple recital of the things that

scouts do, with perhaps an opportunity to look over the Manual, will be enough to launch the organization. The selection of a patrol leader will then follow, and the scouting can begin. It is well not to attempt too much at the start. Get the boys to start work to pass the requirements for the tenderfoot.

The Patrol Leader: Each patrol should have a patrol leader — preferably a boy. The choice of this leader has much to do with the success of the patrol. He should be a recognized leader among the boys in the group. Do not hesitate to entrust him with details. Let him feel that he is your right-hand man. Ask his opinion on matters pertaining to the patrol. Make him feel that the success of the organization depends largely upon him, being careful, of course, not to overdo it. You will find that this attitude will enlist the hearty coöperation of the boy and you will find him an untiring worker, with the ability to bind the boys closer together than you could ever hope to do alone.

POINTS OF INTEREST

1. Scouting does not consist in wearing a khaki suit or a lot of decorations. It is in doing the things that are required for the tenderfoot, second-class and first-class scout badges and the badges of merit.

2. Scouts do not wish any one to buy things for them. They buy their own equipment and pay their own way.

3. Scouts do their best to keep the scout oath and law.

4. The glory of scouting is "*to do a good turn to some one every day without reward.*"

5. Scouts regard the rights of others, and do not trespass on the property or feelings of others.

6. Scouting means obedience and discipline. The boy who can't obey will never command.

7. Scouts are always busy and getting fun out of it — at work, at school, at home, at play. *Be a good scout.*

HOW TO ORGANIZE A TROOP

First: Write to Headquarters, which is at 200 Fifth Avenue, New York City, for a scout master's certificate.

Second: Either combine three or more patrols or having one patrol, appoint several patrol leaders and enlist boys for the new patrols.

Third: The minimum number of patrols in a troop is three, and the maximum the number a scout master can *rightly* handle. Care should be taken not to organize for the sake of a big showing.

Hints on starting: In actually starting a troop, it has been found better to start in a small way. Begin by one or two leader-men making a careful study of "Scouting for Boys," and as soon as the main ideas have been grasped, get together a small number of boys, and go through with them the initial stages step by step, until the boys bubble over with scouting ideals, and until the notion of a fancy uniform and games in the country have given place to a definite desire to qualify for manhood and citizenship. These boys will make the nucleus round which to form a troop, and should pass on their training and enthusiasm to the boys who are enlisting under them. It has been found better to obtain *distinctly older fellows for patrol leaders:* the scout masters should invariably be men who feel the great responsiblity of having boys under their charge, and the possibility of leading the boys from the moment when they enlist in the scouts to the time they pass out again to be fully fledged men.

Finances: The finances necessary to run a troop of scouts should be met by the scouts themselves. It is a main principle of scouting to teach the boys to be self-reliant, and anything which will militate

against the constant sending round of the hat will be a national good.

The Scout Master: The scout master is the adult leader of a troop. The scout master may begin with one patrol. He must have a deep interest in boys, be genuine in his own life, have the ability to lead and command the boys' respect and obedience and possess some knowledge of a boy's ways. He need not be an expert on scoutcraft. The good scout master will discover experts for the various activities. Applications for scout masters' certificates may be made at the Headquarters, 200 Fifth Avenue, New York City.

From the outset, the scout master must have the interest of each boy at heart. He must not play favourites with any of the boys in his patrol or troop. While there are sure to be boys in the group who will develop more rapidly than others, and whose keenness will be sure to call forth the admiration of the scout master, he should not permit himself to be "carried away" by the achievements of these "star boys" to such an extent that he will neglect the less aggressive boy. The latter boy is the one who needs your attention most, and your interest in him must be genuine. Every effort

he makes, no matter how poor it may be, should be commended just as heartily as the better accomplishments of the more handy boy.

PRACTICAL ACTIVITIES FOR SCOUTS

1. *Scoutcraft:* Boy Scouts' organization, scout laws, discipline, scouts' secret signs, badges, etc.

2. *Campaigning:* Camp life and resourcefulness. Hut and mat making. Knots. Fire lighting. Cooking. Boat management. Judging distances, heights and numbers. Swimming. Cycling. Finding the way.

SIGN POSTS

1. Do not have in the same patrol boys of great disparity in ages. For instance, the boy of twelve should not be in the same group with the sixteen-year-old boy, if it can possibly be avoided. You must remember that in most cases the things that appeal to the younger boy will have no attraction for the older boy.

2. Do not enroll boys under twelve. If you do you are certain to lose your older boy. The movement is distinctly for boys of the adolescent period and is designed to help them to rightly catch the spirit of helpfulness.

3. Do not try to do everything yourself. Try to remember that the boys are always willing and anxious to take hold. Let the boys understand that the whole proposition is theirs. It is what they make it. Your contract with them should be largely of a big brother nature.

4. Do not burden nor weary the boys with excessive military drills and tactics. The movement is not a military one. The military virtues of obedience, neatness, order, endurance and erect, alert bearing, however, are scout virtues. Use everything that develops boys. This is good scoutcraft.

5. Do not confine the activities of the patrols to things of one character. Touch every activity as far as possible. Do not omit anything. Get the proper agencies to coöperate with you for these ends — a military man for signalling; a naturalist for woodcraft; a physician for first aid, etc.

6. Do not permit the boys to fail in the proper keeping of the scout oath and law.

7. Never fail to keep an engagement with your patrol or troop. If something should delay your coming or should you find yourself unable to keep an appointment with them, be sure to notify the patrol leaders beforehand. It might be well to require the same of the boys.

8. A real danger point is the failure of a scout master to visit the boys in their homes. Knowing the boys' parents means much, and their coöperation will be much heartier when they know the man to whose care they entrust their boy, after he has discussed with them the real purpose of the scout movement.

9. Do not hesitate to give a boy a hard task, but not an impossible one. A boy likes to do hard things.

10. Do not attempt right at the start to give the boy every bit of detail regarding the activities of the troop. Work out the plans with the boys from time to time, always reserving some things of interest for the next meeting. Your attempt to give them everything at one time will cause the whole proposition to assume the nature of a task instead of pleasurable education, as was originally intended.

11. Hold frequent tests for advancement to the classes of scouthood. Get your fellows to really win their badges.

12. As a scout master use good judgment. If there are other scout masters in your town, or a scout council or local committee, coöperate with these. To be a scout master, you must have the

spirit of '76, but be sure to work with others. The boys will benefit by the lesson.

THE SCOUTS' CAMP

To go camping should mean more than merely living under canvas away from the piles of brick and stone that make up our cities. To be in the open air, to breathe pure oxygen, to sleep upon "a bed of boughs beside the trail," to look at the camp fire and the stars, and to hear the whisper of the trees — all of this is good. But the camp offers a better opportunity than this. It offers the finest method for a boy's education. Between twelve and eighteen years the interests of a boy are general ones, and reach from the catching of tadpoles and minnows to finding God in the stars. His interests are the general mass interests that are so abundant in nature, the activities that give the country boy such an advantage for the real enjoyment of life over the city lad. Two weeks or two months in camp, they are too valuable to be wasted in loafing, cigarette smoking, card playing or shooting craps. To make a camp a profitable thing there must needs be instruction; not formal but *informal* instruction. Scouting, nature study, scout law, camp cooking, signalling, pioneering, path finding, sign reading,

stalking for camera purposes, knowledge of animals and plants, first aid, life saving, manual work (making things), hygiene, sex instruction, star gazing, discipline, knowing the rocks and trees, and the ability to do for one's self, in order that a boy may grow strong, self-reliant, and helpful. This is a partial list of the subject in the camp curricula.

A model scout camp programme is given here. It takes eight days to carry it out, but there is material enough to run ten times the number of days specified.

A Sir R. S. S. Baden-Powell Scout Camp Model Programme

First Day: Preliminary work: settling into camp, formation of patrols, distribution of duties, orders, etc.

Second Day: Campaigning: camp resourcefulness, hut and mat making, knots, fire lighting, cooking, health and sanitation, endurance, finding way in strange country, and boat management.

Third Day: Observation: noticing and memorizing details far and near, landmarks, tracking, deducing meaning from tracks and signs, and training the eyesight.

Fourth Day: Woodcraft: study of animals, birds,

plants and stars; stalking animals, noticing people, reading their character and condition, and thereby gaining their sympathy.

Fifth Day: Chivalry: honour, code of knights, unselfishness, courage, charity and thrift; loyalty to God, country, parents and employers, or officers; practical chivalry to women; the obligation to do a "good turn" daily, and how to do it.

Sixth Day: Saving life: from fire, drowning, sewer gas, runaway horses, panic, street accidents, improvised apparatus, and first aid.

Seventh Day: Patriotism: national geography, the history and deeds that won our world power, the navy and army, flags, medals, duties of a citizen, marksmanship, helping the police.

Eighth Day: A summary of the whole course: sports comprising games and competitive practices in all subjects of the course.

CAMP ROUTINES

6.30	a.m.	Turn out, bathe, etc.
7.00	"	Breakfast
8.00	"	Air bedding in sun if possible
9.00	"	Scouting games and practice
11.00	"	Swimming
12.00	m.	Dinner

1.00 p.m. Talk by leader
2.00 " Water games, etc.
6.00 " Supper
7.30 " Evening council around camp fire

Order of business:

Opening council	Complaints
Roll-call	Honours
Record of last council	New scouts
Report of scouts	New business
Left-over business	Challenges

Social doings, songs, dances, stories
Closing council (devotional services when desired)
10.00 p.m. Lights out.

The father of scouting for boys in America, and in fact the inspiration for the movement in England under Lieut.-Gen. Sir Robert S. S. Baden-Powell, K.C.B., is Mr. Ernest Thompson Seton, the distinguished naturalist and nature student.

The official handbook of the organization may be obtained from Doubleday, Page and Company, Garden City, N. Y., the publishers of this book, or from the national headquarters of The Boy Scouts of America.

III

CAMPS AND CAMPING

How to select the best place and to pitch the tent — A brush bed — The best kind of a tent — How to make the camp fire — What to do when it rains — Fresh air and good food — The brush leanto and how to make it

GOING camping is the best fun in the world if we know how to do it. Every healthy boy and girl if given an opportunity should enjoy living outdoors for a week or two and playing at being an Indian. There is more to camping however than "roughing it" or seeing how much hardship we can bear. A good camper always makes himself just as comfortable as he can under the circumstances. The saying that "an army travels on its stomach" means that a soldier can not make long marches or fight hard unless he has good food. The surest sign of a "tenderfoot" is the boy who makes fun of you because you try to have a soft dry bed while he prefers to sleep on the ground under the mistaken idea that it is manly or brave. He will usually spoil a trip in the woods for every one in the party.

Another poor kind of a camper pitches his tent so that his bed gets wet and his food spoiled on the first rainy day, and then sits around cold and hungry trying hard to think that he is having fun, to keep from getting homesick. This kind of a boy "locks the door after the horse is stolen." If we go camping we must know how to prevent the unpleasant things from happening. We must always be ready for wind and rain, heat and cold. A camping party should make their plans a long time ahead in order to get their equipment ready. Careful lists should be made of what we think we shall need. After we are out in the woods, there will be no chance to run around the corner to the grocer's to supply what we have forgotten. If it is forgotten, we must simply make the best of it and not allow it to spoil our trip.

It is surprising how many things that we think are almost necessary to life we can get along without if we are obliged to. The true woodsman knows how to turn to his use a thousand of nature's gifts and to make himself comfortable, while you and I might stand terrified and miserable under the same conditions.

Daniel Boone, the great wilderness traveller, could go out alone in the untracked forest with noth-

ing but his rifle, his axe and a small pack on his back and by a knowledge of the stars, the rivers, the trees and the wild animals, he could go for weeks travelling hundreds of miles, building his bed and his leanto out of the evergreen boughs, lighting his fire with his flint and steel, shooting game for his food and dressing and curing their skins for his

With a head shelter and a sleeping bag he can keep dry and warm

clothing and in a thousand ways supplying his needs from nature's storehouse. The school of the woods never sends out graduates. We may learn something new every day.

The average city boy or girl does not have an opportunity to become a skilled master of woodcraft, but because we cannot learn it all is no reason why we should not learn something. The best way

to learn it is in the woods themselves and not out of books.

A party of four boys makes a good number for a camping trip. They will probably agree better than two or three. They can do much of the camp work in pairs. No one need to be left alone to look after the camp while the others go fishing or hunting or to some nearby town for the mail or for supplies. There is no reason why four boys of fifteen who are resourceful and careful cannot spend a week or two in the woods in perfect safety and come back home sounder in mind and body than when they left. It is always better to take along some one who has "camped out" before. If he cannot be found, then make your plans, decide what you will do and how you will do it, take a few cooking lessons from mother or the cook — if the latter is good-natured — and go anyway. First elect a leader, not because he is any more important than the rest but because if some one goes ahead and gives directions, the life in camp will run much more smoothly and every one will have a better time.

If it is your first experience in camping, you had better go somewhere near home. The best place is one that can be reached by wagon. If we have to carry our supplies on our backs or in a canoe, the

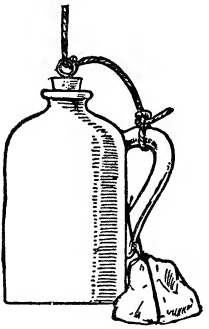
amount we can take will be much less. After you have had some experience near home you can safely try the other way. Where you go is of comparatively little importance. Near every large city there is some lake or river where you can find a good camping site. Campers always have more fun if they are near some water, but if such a place is not easily found near where you live, go into the woods. Try to get away from towns or villages. The wilder the place is, the better.

You had better make sure of your camping ground before you go by writing a letter to the owner of the land. It isn't much fun after we have pitched the tent and made everything shipshape to have some angry landowner come along and order us off because we are trespassers.

In selecting a place to camp, there are several very important things to look out for.

1. Be sure you are near a supply of drinking water. A spring or a brook is best, but even the lake or river will do if the water is pure and clean. The water at the bottom of a lake is always much colder and cleaner than the surface water. When I was a boy, I used a simple device for getting cold water which some of you may like to copy. I took an old-fashioned jug and fastened a strong string to

the handle and also fastened this string to the cork of the jug as the drawing shows. The jug was weighted so that it would sink, by means of a piece of stone tied to the handle. We used to go out to the middle of the lake where the water was the deepest and lower the jug over the side of a boat. When it reached bottom we would give the string a sharp tug and thus pull out the cork. The bubbles coming to the surface showed us when the jug was full. We then hauled it on board and had clear, cold, drinking water from a lake that on the surface was warm enough for swimming.



The jug by which we obtained pure, cold water

2. The next important thing in selecting a camp is being near a supply of firewood. A week in camp will consume an amazing amount of wood, especially if we have a camp fire at night to sit around and sing and tell stories before turning in. In most sections there is plenty of dead wood that we can use for camp fires. This does not mean a lot of twigs and brush. There is no use trying to go camping unless some one knows how to use an axe. In another

chapter I will tell you something about the proper use of axes and hatchets. For the present it is sufficient to say that an excellent place to practise handling an axe is on the family woodpile. You will thus combine business and pleasure, and your efforts will be appreciated by your family, which would not be the case if, like George Washington, you began your lessons in woodcraft on the favourite cherry tree.

Almost any kind of wood will burn when it is dry, but it takes experience to know the kinds of trees that will burn when they are green. If there is no dry wood in the neighbourhood, and we are obliged to cut a tree down to get our supply, it is very important to pitch our camp somewhere near the right kind of a tree and not be obliged to carry our firewood a long distance. The best "green wood" for the campers' fire is hickory, although birch is excellent. Hickory is also the best dry wood. Other trees that will burn well when green are cedar, white ash, locust or white oak. There are comparatively few places, however, where dry wood is not available and of course it is always best to avoid such a place.

3. The camp site should be in a fairly open spot. Thick woods and underbrush are either hot or

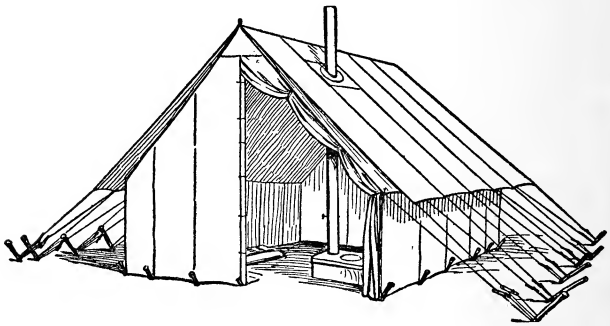
"damp" cool. If you can find a site that is shaded during the heat of the day so much the better. It is unwise to pitch the tent under a tree that stands alone on account of possible danger from lightning. If your tent is shaded by a tree be sure there are no dead limbs to blow off and wreck it during a storm.

Be sure that the drainage is good, so that in case of heavy rains, the water will run off and not flood the camp. It is very important if your camp is along some river or stream to be high enough to avoid the danger of sudden floods. This can usually be determined by talking to some one who knows the country. You can also tell it by studying the previous high water marks in the trees. In case of floods there are always some wisps of straw, pieces of brush, etc., caught and held by the limbs of trees after the water settles back to its former level. It is a good chance to practise your woodcraft by trying to find them.

Damp locations are very bad. The higher we can get, the drier it will be. We avoid both fogs and mosquitoes. Usually there is some prominent place that will give us a good outlook and where the breezes can reach us.

There are both good and bad points in pitching our tent on the site of a former camp. As long as

the former campers have not scoured the surrounding neighbourhood for firewood nor have left a place littered up with all sorts of rubbish and garbage to draw flies and vermin, they may have fixed up things around the camp site to save us work and to



A wall tent

add to our comfort and pleasure. Each case will have to be decided on its own merits.

The three important things then are the water supply, the firewood supply, and good drainage.

Next in importance to the camp site is the outfit, and the most important thing is the tent. For a party of four boys on their first camping trip, the best kind will be a wall tent. A tent, 11 x 14 feet will be large enough to provide sleeping quarters and to have every one comfortable. A simple

shelter of canvas outside can be provided as a dining-room but this is more of a luxury than a real necessity.

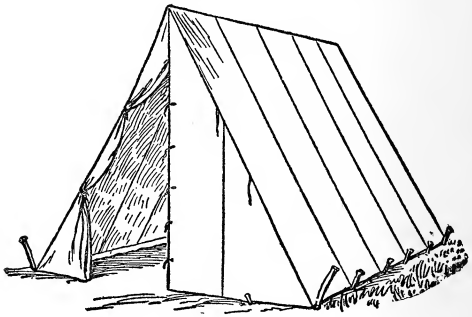
Canvas or duck is the common material from which tents are made. The standard eight-ounce khaki duck used in the United States army will, for this size tent, cost about twenty dollars. This will include a fly, which is merely a second roof to the tent. The best material for tents is balloon silk. It is much more waterproof than canvas and only weighs a quarter as much. It is also much more expensive. A tent can be made at home, which is of course the cheaper way. They can also be hired from previous campers or from some awning maker who is also usually a tent maker.

A canvas tent without a fly will leak in a rain storm if the roof is touched on the inside either by our hands or our clothing. It may be made partially waterproof by a coating of paraffine which has been previously dissolved in turpentine. The simplest and at the same time the warmest tent for an experienced camper who knows the tricks of the trade is a leanto tent, one with one side entirely open, in front of which a blazing fire may be kept burning. This is hardly adapted for boys on their first trip, however.

Another very good and very simple tent is the

"A" tent used in the army. This looks like a "V" turned upside down. We can pitch it without the aid of tent poles by simply hanging it beween two trees to which a rope has been stretched.

The Hudson Bay tent, trapper's tent, forester's tent, canoe tent, and a dozen others, including an Indian tepee and wigwam, are all good tents for



An "A" tent

special purposes. The pictures show the different styles and all of them are designed for special uses, either for warmth or lightness in carrying or ease in pitching. If we go camping in summer and can have our equipment or "duffle," as the woodsmen call it, carried by team, the wall tent will be the best one to take.

Tent pegs can always be cut in the woods, but it is far more satisfactory to get them ready at home

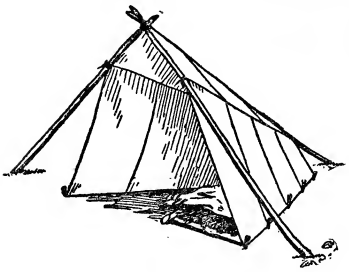
before we leave. If you do cut your own pegs, select hardwood saplings to make them from and to further harden the points, char them slightly in a fire. If you spend a few winter evenings at home making the pegs, it will save you a lot of time and trouble when you reach the camping ground. The best pegs are made of iron or steel. This is especially true when the ground where they are to be driven is hard or rocky, which is usually the case. Steel tent pins may be bought for six cents apiece or possibly the local blacksmith will make them for less. They should be a foot long.

A sod cloth is a strip of canvas eight or ten inches wide fastened to the bottom of the tent wall. Its purpose is to keep the wind and rain from blowing under the tent. After the tent is pitched a ditch should be dug all around it to catch the rain and carry it away. The earth that is dug from this trench may be thrown on the sod cloth to hold it down.

It is an excellent idea, if you are a beginner, to practise pitching the tent at home so that you will understand it better when you are in the woods. Besides this, you can try sleeping out a night or two to see how you are going to like it.

When you reach your camping place, the first

step is to clear the ground of all rubbish, loose stones, sticks and brush to have a clean floor. Then unpack the tent and fit the pegs of the two upright poles through the two holes in the ridge pole. Next raise the tent and peg the guy ropes on the four corners first. A little practice will show you how to do this. After all the ropes are pegged at a proper distance from the tent, they should be tightened and the tent made secure.



A trapper's tent

Always plan to have a full four hours of daylight to make your camp ready. If the drive is a long one and you are obliged to get up very early in the morning, you will have to do it, that is all. I made my first camping trip when I was twelve years old. We had just reached the camping ground, unloaded our kit and sent the team home that brought us when — bang! over the mountain across the lake from where we were going to camp, a terrific thunder shower came up and in a few minutes it was pouring. There was our whole outfit — tent, bedding and food

— getting soaked because, instead of hurrying along during the day, we had fooled away our time trying to catch fish in wayside brooks that had never seen a fish and not realizing how important it is to make haste as well as hay while the sun shines.

We quickly pitched the tent, not as it should have

An Indian tepee

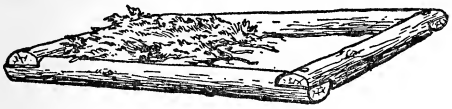
been pitched, but in a heap over the rest of our goods to keep out as much water as possible and then ran for a nearby barn where we spent a cold hungry night, wetter but wiser. The next day, out came the sun and dried our things, but if the rain had continued we certainly should have been obliged to go home or at least to a farmhouse to stay until the weather

cleared. We soon forgot our unpleasant experience but we have not forgotten the lesson it taught — and that is not to waste time along the road when there is work to be done at the journey's end.

Next to a good tent, the most important thing for the camper is a good bed. It is even more important than good food because if we sleep well, hunger will furnish the sauce for our grub, but if we spend the night trying to dodge some root or rock that is boring into our back and that we hardly felt when we turned in but which grew to an enormous size in our imagination before morning, we will be half sick and soon get enough of being an Indian. A canvas cot makes the best camp bed if it can be taken along conveniently. There is one important thing to look out for in sleeping on a cot. In my first experience of the kind, I nearly froze. I kept piling things on me until all my clothing, and even the camp towels and table-cloth were pressed into service and was thinking about pulling some dry grass to pile on the rest of the stuff. Still I shivered until I discovered that the cold was coming up from underneath because there was nothing to keep it out but the single thickness of canvas. When I put one of my blankets under me, I was as warm as toast.

Very often it is impossible to carry cots on a trip,

and that is where a knowledge of woodcraft comes in. The softest, sweetest, downiest bed in the world can be made with no other materials but those which grow in the forest — if we know how. At least the tired camper will think it is soft and will sleep on it like a top and wake up refreshed in the morning. Perhaps if we had our choice we would prefer our own bed at home, but in the woods we do not have this choice. Most people call this



How the bough bed is made

a bed of "pine boughs." Why I do not know as it never should be made of pine under any circumstances. The best wood for the bough bed is balsam. If this does not grow in the neighbourhood, hemlock, spruce, or even cedar will do. To make a bough bed properly means a lot of work. The first step is to cut four straight sticks. The side pieces should be six feet and a half long and the end pieces three feet and a half. They should be notched on the ends with an axe and either nailed or tied together from saplings or from a tree that you have felled. Small balsam boughs should be broken off with the fingers

and laid one on the other until the whole bed is filled with them. On this, the rubber blanket or poncho should be spread and the blankets over all. All the boughs should be shingled with the stems down to keep them in the best condition. This kind of a bed will require remaking every day.

A better bed for the boy camper is made as follows: Take a piece of heavy bed ticking and sew it into a bag about three feet by six feet. When you reach camp you can make a regular mattress by filling it with whatever material is most easily found. Dry leaves, grass, hay, even moss or wet filler can be used if nothing dry can be found, but in this case the rubber blanket will be an absolute necessity. Of course it is much better to use some dry material.

Be sure to have a comfortable bed. No matter what ideas you may have about cowboys and soldiers rolling up in their blankets and snatching a few hours' sleep under the stars by lying on the bare ground, a boy who is used to a good bed at home will never have much fun out of a camping trip if he tries to sleep on the ground with a rock for his pillow.

For a summer camping trip, one blanket is enough. You must learn to roll up in it. Lie flat on your back and cover the blanket over you. Then raise

up your legs and tuck it under first on one side and then the other. The rest is easy. This beats trying to "roll up" in it, actually. The common summer blankets used at home are not much use for the camper. These are usually all cotton. A camper's blanket should be all wool. You can buy a standard U. S. Army blanket, size 66 x 84 inches, for five dollars. They can often be purchased in stores that deal in second hand army supplies for much less and are just as good as new except for some slight stain or defect.

A sleeping bag is expensive but is excellent for cold weather camping. It is much too hot for the boy camper in summer.

Do not sleep in your clothing. Unless it is too cold, undress, about as you do at home. If the blanket feels tickly, it would not be a great crime, no matter what the tenderfoot says who wanted you to sleep on the ground, to take along a sheet. I have never done this, however.

At the end of this chapter, you will find a list of things to take with you.

The camp fire and the cooking fire should be separate. Almost any one can kindle a fire with dry materials. It takes a woodman to build a fire when it has been raining and everything is wet. The

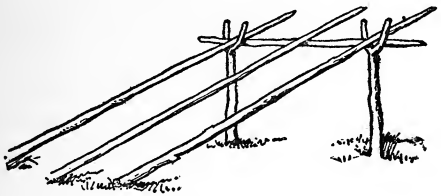
boy's method of taking a few newspapers, and a handful of brush or leaves will not do.

First look around for an old dead top of a pine or cedar. If you cannot find one, chop down a cedar tree. Whittle a handful of splinters and shavings from the dry heart. Try to find the lee side of a rock or log where the wind and rain do not beat in. First put down the shavings or some dry birch bark if you can find it, and shelter it as well as you can from the rain. Pile up some larger splinters of wood over the kindling material like an Indian's wigwam. Then light it and give it a chance to get into a good blaze before you pile on any larger wood and put the whole fire out. It sounds easy but before you try it in the woods I advise you to select the first rainy day and go out near home and experiment.

To make a fire that will burn in front of the tent all night, first drive two green stakes into the ground at a slant and about five feet apart. Then lay two big logs one on each side of a stake to serve as andirons. Build a fire between these logs and pile up a row of logs above the fire and leaning against the stakes. You may have to brace the stakes with two others which should have a forked end. When the lower log burns out the next one

will drop down in its place and unless you have soft, poor wood the fire should burn for ten hours. With this kind of a fire and with a leanto, it is possible to keep warm in the woods, on the coldest night in winter.

This is the way to build a brush leanto: First cut two sticks and drive them into the ground. They should have a point on one end and a fork on



The frame for a brush leanto

the other. Lay a stout pole across the two forks like a gypsy fire rig. Then lean poles against the crosspiece and finally thatch the roof with spruce, hemlock or other boughs and pile up boughs for the sides. A brush camp is only a makeshift arrangement and is never weather proof. It is simply a temporary shelter which with the all-night fire burning in front will keep a man from freezing to death in the woods. Any kind of a tent is better or even a piece of canvas or a blanket for the roof of the leanto will be better than the roof of boughs.

Be careful not to set the leanto on fire with the sparks from your camp fire.

Mosquitoes have probably spoiled more camping trips that any other one thing. The best tents have mosquito net or cheese cloth fronts which may be held close to the ground by a stick on the bottom. Perhaps the easiest way to secure protection is for each boy to take along a few yards of cotton mosquito netting and by means of curved sticks build a canopy over his bed.

A smoky fire called a "smudge" will sometimes keep the pests away from the neighbourhood of the tent or if we build it in the tent will drive them out, but the remedy is almost as bad as the disease. As a rule they will only be troublesome at night and the net over our bed will enable us to sleep in peace.

The most common "dope" used in the woods to keep off mosquitoes is called oil of citronella. It has a very pungent odour that the mosquitoes do not like and the chances are that you will not like it either. At the same time it may be a good plan to take a small bottle along.

You may safely count on finding mosquitoes, no matter where you go or what the people tell you who live there. Perhaps they have never tried sleeping in the woods and do not know. Be sure

therefore to take along some netting or cheese cloth to protect yourself against them.

Everything that you can do at home to get ready for your camping trip will add to your pleasure when you get out in the woods. If any part of your kit needs fixing, fishing rods wound or varnished, your jackknife ground, your camera fixed, or if your clothing needs any patches or buttons, do it at home.

No one ever does half that he plans to on a trip like this unless he does not plan to do anything. Take along a few books to read for the rainy days and have them covered with muslin if you ever expect to put them back into your library.

If you have been putting off a visit to the dentist, by all means do it before you get out where there are no dentists. An aching tooth can spoil a vacation in the woods about as easily as anything I know of.

As a final word of advice to the beginner in camping, let me tell you a few things that my own experience has taught me.

A felt hat is better than a cap as it is sun and rain proof.

Wear a flannel shirt and take one extra one. You can wash one and wear the other. Be sure to

have a new shirt plenty loose in the neck as camp washing in cold water will make it shrink. Do not go around in gymnasium shirts or sleeveless jerseys. One of my companions did this once and was so terribly sunburned that his whole trip was spoiled.

Two sets of underwear are plenty, including the one you wear.

Take along a silk handkerchief to wear around your neck.

Wear comfortable shoes. A camping trip is a poor place to break in new hunting boots or shoes.

Take bandanna handkerchiefs and leave your linen ones at home.

If you have to choose between a coat and a sweater take the sweater and leave the coat at home. A coat is out of place in the woods.

Khaki or canvas trousers are excellent. So are corduroy. An old pair of woollen trousers are just as good as either.

A poncho is almost necessary to your comfort. It is merely a rubber or oilskin piece with a slit in it to put your head through. The right size is 66 x 90 inches. With it you can keep dry day or night, either using it as a garment or as a cover. When you are not using it you can cover it over your bed or food supply.

Take along a good pocket knife and compass. Better leave the revolver home. Also always carry a waterproof box of matches.

You will require some kind of a waterproof "duffle" bag to carry your personal things — tooth brush, extra clothing, mirror, fishing tackle, towel, soap, medicine, in fact whatever you think you will need. If it is your first camping trip you will come home without having had any use whatever for more than half the things you take. That is the experience of every one, so do not become discouraged.

If you camp within reach of a post-office, address some stamped envelopes to your home in ink before you leave. Then you will have no excuse for not writing a letter home.

You can make an excellent pillow by rolling up your trousers. Be sure to take everything out of the pockets first, including your knife, and roll them with the top inside so that the buttons or your belt buckle will not bore into your ear.

If you fall overboard and come ashore to dry out, stuff your shoes full of dry grass or old paper to keep them from shrinking. When they are dry, soften them with tallow or oil. Every one who goes camping at some time or other gets wet. The only advice I can give you is to get dry again as soon

as possible. As long as you keep moving it will probably not injure you. Waterproof garments are of little use in the woods. They are always too warm for summer wear and by holding the perspiration, are more of an injury than a benefit.

Never wear rubber boots in the woods or you will surely take cold. Better have wet feet. The best foot wear is moccasins. If you wear them see that they are several sizes too large and wear at least two pairs of heavy woollen stockings with them.

IV

CAMP COOKING

How to make the camp fire range — Bread bakers — Cooking utensils — The grub list — Simple camp recipes

MOST boys, and I regret to say a few girls too, nowadays, seem to regard a knowledge of cooking as something to be ashamed of. The boy who expects to do much camping or who ever expects to take care of himself out in the woods had better get this idea out of his head just as soon as possible. Cooking in a modern kitchen has been reduced to a science, but the boy or man who can prepare a good meal with little but nature's storehouse to draw on and who can make an oven that will bake bread that is fit to eat, with the nearest range fifty miles away, has learned something that his mother or sister cannot do and something that he should be very proud of. Camp cooking is an art and to become an expert is the principal thing in woodcraft — nothing else is so important.

We often hear how good the things taste that have been cooked over the camp fire. Perhaps a

good healthy appetite has something to do with it, but it is pretty hard even for a hungry boy to relish half-baked, soggy bread or biscuits that are more suitable for fishing sinkers than for human food. A party without a good cook is usually ready to break camp long before the time is up, and they are lucky if the doctor is not called in as soon as they get home.

There is really no need for poor food in the woods. Very few woodsmen are good cooks simply because they will not learn. The camp cook always has the best fun. Every one is ready to wait on him "*if he will only, please get dinner ready.*"

One year when I was camping at the head of Moosehead Lake in Maine, I had a guide to whom I paid three dollars a day. He cooked and I got the firewood, cleaned the fish and did the chores around camp. His cooking was so poor that the food I was forced to eat was really spoiling my trip. One day I suggested that we take turns cooking, and in place of the black muddy coffee, greasy fish and soggy biscuit, I made some Johnny cake, boiled a little rice and raisins and baked a fish for a change instead of frying it. His turn to cook never came again. He suggested himself that he would be woodchopper and scullion and let me do the cooking.

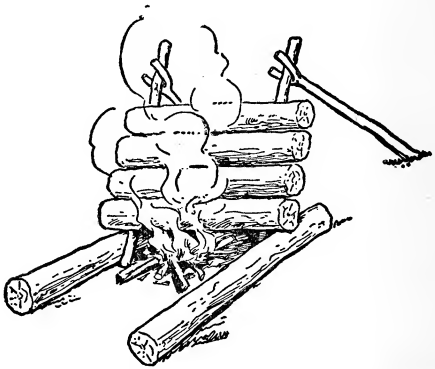
I readily agreed and found that it was only half as much work as being the handy man.

The basis of camp cooking is the fire. It is the surest way to tell whether the cook knows his business or not. The beginner always starts with a fire hot enough to roast an ox and just before he begins cooking piles on more wood. Then when everything is sizzling and red-hot, including the handles of all his cooking utensils, he is ready to begin the preparation of the meal. A cloud of smoke follows him around the fire with every shift of the wind. Occasionally he will rush in through the smoke to turn the meat or stir the porridge and rush out again puffing and gasping for breath, his eyes watery and blinded and his fingers scorched almost like a fireman coming out of a burning building where he has gone to rescue some child. The chances are, if this kind of a cook takes hold of the handle of a hot frying pan, pan and contents will be dumped in a heap into the fire to further add to the smoke and blaze.

When the old hand begins to cook, he first takes out of the fire the unburned pieces and blazing sticks, leaving a bed of glowing coals to which he can easily add a little wood, if the fire gets low and a watched pot refuses to boil to his satisfaction. When the

fire is simply a mass of red coals he quietly goes to cooking, and if his fire has been well made and of the right kind of wood, the embers will continue to glow and give out heat for an hour.

Of course, if the cooking consists in boiling water for some purpose, there is no particular objection



A type of camp fire that will burn all night

to a hot fire, the fire above described is for broiling, frying and working around generally.

There are all sorts of camp fireplaces. The quickest one to build and one of the best as well, is the "hunter's fire." All you need is an axe. Take two green logs about six to eight inches thick and five feet long and lay them six inches apart at one end and about fourteen inches at the other. Be

sure that the logs are straight. It is a good plan to flatten the surface slightly on one side with the axe to furnish a better resting place for the pots and pans. If the logs roll or seem insecure, make a shallow trench to hold them or wedge them with flat stones. The surest way to hold them in place is to drive stakes at each end. Build your fire between the logs and build up a cob house of firewood. Split wood will burn much more quickly than round sticks. As the blazing embers fall between the logs, keep adding more wood. Do not get the fire outside of the logs. The object is to get a bed of glowing coals between them. When you are ready to begin cooking, take out the smoky, burning pieces and leave a bed of red-hot coals. If you have no axe and can find no logs, a somewhat similar fireplace can be built up of flat stones, but be sure that your stone fireplace will not topple over just at the critical time.

If you only have your jack-knife, the best fire is a "Gypsy Rig." Cut two crotched sticks, drive them into the ground and lay a crosspiece on them just as you would begin to build the leanto described in the preceding chapter, but of course not so high above the ground. The kettles and pots can be hung from the crossbar by means of pot hooks,

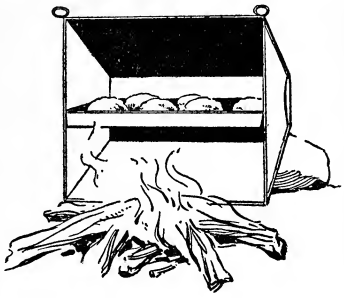
which are pieces of wood or wire shaped like a letter "S." Even straight sticks will do with two nails driven into them. These should be of different lengths to adjust the pots at various heights above the fire, depending on whether you wish to boil something furiously or merely to let it simmer. Do not suspend the kettles by running the bar through them. This is very amateurish. With a gypsy fire, the frying pan, coffee pot and gridiron will have to be set right on the bed of coals.

An arrangement for camp fires that is better and less work than the logs is obtained by using fire irons, which are two flat pieces of iron a yard or so long resting on stones and with the fire built underneath.

The whole object of either logs or irons is to furnish a secure resting place for cooking utensils above the fire.

There are several kinds of ovens used for baking bread and roasting meat in outdoor life. The simplest way is to prop a frying pan up in front of the fire. This is not the best way but you will have to do it if you are travelling light. A reflector, when made of sheet iron or aluminum is the best camp oven. Tin is not so satisfactory because it will not reflect the heat equally. Both the top

and bottom of the reflector oven are on a slope and midway between is a steel baking pan held in place by grooves. This oven can be moved about at will to regulate the amount of heat and furthermore it can be used in front of a blazing fire without waiting for a bed of coals. Such a rig can easily be made by any tinsmith. A very convenient folding reflector oven can be bought in aluminum for three or four dollars. When not used for baking, it makes an excellent dishpan.



A reflector camp oven

The standard camp oven that has been used by generations of pioneers and campers is the Dutch oven. It is simply an iron pot on short legs and is provided with a heavy cover. To use it, dig a hole in the ground large enough to hold it, build a fire and fill the hole with embers. Then scoop out a place for the pot, cover it over with more embers and ashes and let the contents bake.

For the boy who wants to go to the limit in depending on his own resources, the clay oven is the

nearest to real woodcraft. This is made in the side of a bank by burrowing out a hole, with a smoke outlet in the rear. A hot fire built inside will bake the clay and hold it together. To use this oven, build a fire in it and when the oven is hot, rake out the coals and put in your bread or meat on flat stones. Close the opening with another stone and keep it closed long enough to give the oven a chance. This method is not recommended to beginners who are obliged to eat what they cook, but in the hands of a real cook, will give splendid results. The reflector oven is the best for most cases if you can carry it conveniently.

The kind of a cooking equipment that we take with us on a camping trip will depend on what we can carry conveniently, how much we are willing to rough it and what our stock of provisions will be. One thing is sure — the things that we borrow from home will rarely be fit to return. In making a raid on the family kitchen, better warn the folks that they are *giving* us the pots and pans instead of merely *lending* them. Very compact cooking outfits can be bought if one cares to go to the expense. An aluminum cook kit for four people, so made that the various articles nest one into the other, can be bought for fifteen dollars. It weighs only ten pounds

and takes up a space of 10 x 12 inches. Such a kit is very convenient if we move camp frequently or have to carry our outfit with us, but for the party of boys going out by team it is not worth the expense. You will need several tin pails, two iron pots, a miner's coffee pot — all in one piece including the lip — two frying pans, possibly a double boiler for oatmeal and other cooked cereals, iron spoon, large knife, vegetable knife, iron fork and broiler. A number of odds and ends will come in handy, especially tin plates to put things on. Take no crockery or glassware. It will be sure to be broken. Do not forget a can opener.

Camp fire utensils should never be soldered. Either seamless ware or riveted joints are the only safe kind. Solder is sure to melt over a hot open fire.

The personal equipment for each boy should be tin cup, knife, fork, and spoons, deep tin plate, extra plate and perhaps one extra set of everything for company if they should happen to drop in. A lot of dish washing can be avoided if we use paper or wooden plates and burn them up after the meal.

The main question is "What shall we take to eat." A list of food or as it is commonly known "the grub list" is a subject that will have to be de-

cided by the party themselves. I will give you a list that will keep four hungry boys from staying hungry for a trip of two weeks and leave something over to bring home. If the list does not suit you exactly you can substitute or add other things. It is an excellent plan for the party to take a few home cooked things to get started on, a piece of roasted meat, a dish of baked beans, some crullers, cookies or ginger snaps. We must also consider whether we shall get any fish or game. If fishing is good, the amount of meat we take can be greatly cut down.

This list has been calculated to supply a party who are willing to eat camp fare and who do not expect to be able to buy bread, milk, eggs or butter. If you can get these things nearby, then camping is but little different from eating at home.

GRUB LIST

Ten lbs. bacon, half a ham, 4 cans corned beef, 2 lbs. cheese, 3 lbs. lard, 8 cans condensed milk, 8 lbs. hard tack, 10 packages soda crackers, 6 packages sweet crackers, 12½ lbs. of wheat flour, 12½ lbs. of yellow cornmeal, can baking powder, ½ bushel potatoes, 1 peck onions, 3 lbs. ground coffee, ½ lb. tea, sack salt, 7 lbs. granulated sugar, 3 packages prepared griddle cake flour, 4 packages assorted

cereals, including oatmeal, 4 lbs. rice, dried fruits, canned corn, peas, beans, canned baked beans, salmon, tomatoes, sweetmeats and whatever else you like.

Be sure to take along plenty of tin boxes or tight wooden boxes to keep rain and vermin away from the food. Tell your grocer to pack the stuff for a camping trip and to put the perishable things in tight boxes as far as possible.

If you are going to move camp, have some waterproof bags for the flour. If you can carry eggs and butter, so much the better. A tin cracker box buried in the mud along some cold brook or spring makes an excellent camper's refrigerator especially if it is in the shade. Never leave the food exposed around camp. As soon as the cook is through with it let some one put it away in its proper place where the flies, ants, birds, sun, dust, and rain cannot get at it.

Always examine food before you cook it. Take nothing for granted. Once when camping the camp cook for breakfast made a huge pot of a certain brand of breakfast food. We were all tucking it away as only hungry boys can, when some one complained that caterpillars were dropping from the tree into his bowl. We shifted our seats — and

ate some more, and then made the astonishing discovery that the breakfast food was full of worms. We looked at the package and found that the grocers had palmed off some stale goods on us and that the box was fairly alive. We all enjoy the recollection of it more than we did the actual experience.

It is impossible in a book of this kind to say very much about how to cook. That subject alone has filled some very large books. We can learn some things at home provided that we can duplicate the conditions in the woods. So many home recipes contain eggs, milk and butter that they are not much use when we have none of the three. There is a book in my library entitled "One Hundred Ways to Cook Eggs" but it would not do a boy much good in the woods unless he had the eggs. If you ask your mother or the cook to tell you how to raise bread or make pies and cakes, be sure that you will have the same ingredients and tools to work with that she has.

It might be well to learn a few simple things about frying and boiling, as both of these things can be done even by a beginner over the camp fire. There are a few general cooking rules that I will attempt to give you and leave the rest for you to learn from experience.

You use bacon in the woods to furnish grease in the frying pan for the things that are not fat enough themselves to furnish their own grease.

Condensed milk if thinned with water makes a good substitute for sweet milk, after you get used to it.

To make coffee, allow a tablespoonful of ground coffee to each cup of water. Better measure both things until you learn just how full of water to fill the pot to satisfy the wants of your party. Do not boil coffee furiously. The best way is not to boil it at all but that would be almost like telling a boy not to go swimming. Better let it simmer and when you are ready for it, pour in a dash of cold water to settle the grounds and see that no one shakes the pot afterward to stir up grounds — and trouble.

A teaspoonful of tea is enough for two people. This you must not boil unless you want to tan your stomach. Pour boiling water on the tea and let it steep.

Good camp bread can be made from white flour, one cup; salt, one teaspoonful; sugar, one teaspoonful and baking powder, one teaspoonful. Wet with water or better with diluted condensed milk. Pour in a greased pan and bake in the reflector oven until when you test it by sticking a

wooden splinter into it, the splinter will come out clean without any dough adhering to it.

If you want to make the kind of bread that has been the standard ration for campers for hundreds of years you must eat johnny-cake or pone. It is really plain corn bread. Personally I like it better than any of the raised breads or prepared flours that are used in the woods. It should always be eaten hot and always broken by the hands. To cut it with a knife will make it heavy. The ingredients are simply one quart of yellow meal, one teaspoonful of salt and three cups — one and one-half pints—of warm water. Stir until the batter is light and bake for a short hour. Test it with the wooden splinter the same as wheat bread. It may be baked in an open fire on a piece of flat wood or by rolling up balls of it, you can even roast it in the ashes. A teaspoonful of sugar improves it somewhat and it can be converted into cake by adding raisins or huckleberries. For your butter, you will use bacon grease or gravy.

Indian meal, next to bacon, is the camper's stand-by. In addition to the johnny-cake, you can boil it up as mush and eat with syrup or condensed milk and by slicing up the cold mush, if there is any left, you can fry it next day in a spider.

The beginner at cooking always makes the mistake of thinking that to cook properly you must cook fast. The more the grease sputters or the harder the pot boils, the better. As a rule, rapid boiling of meat makes it tough. Game and fish should be put on in cold water and after the water has boiled, be set back and allowed to simmer. Do not throw away the water you boil meat in. It will make good soup — unless every one in camp has taken a hand at salting the meat, as is often the case.

All green vegetables should be crisp and firm when they are cooked. If they have been around camp for several days and have lost their freshness, first soak them in cold water. A piece of pork cooked with beans and peas will give them a richer flavour. The water that is on canned vegetables should be poured off before cooking. Canned tomatoes are an exception to this rule, however.

Save all the leftovers. If you do not know what else to do with them, make a stew or soup. You can make soup of almost anything. The Chinese use birds' nests and the Eskimos can make soup of old shoes. A very palatable soup can be made from various kinds of vegetables with a few bones or extract of beef added for body.

The length of time to cook things is the most

troublesome thing to the beginner. Nearly everything will take longer than you think. Oatmeal is one of the things that every beginner is apt to burn, hence the value of the double boiler.

Rice is one of the best camp foods if well cooked. It can be used in a great variety of ways like cornmeal. But beware! There is nothing in the whole list of human food that has quite the swelling power of rice. Half a teacupful will soon swell up to fill the pot. A tablespoonful to a person will be an ample allowance and then, unless you have a good size pot to boil it in, have some one standing by ready with an extra pan to catch the surplus when it begins to swell.

There are certain general rules for cooking which may help the beginner although they are not absolute.

Mutton, beef, lamb, venison, chicken, and large birds or fish will require from ten to twenty minutes' cooking for each pound of weight. The principal value of this is to at least be sure that you need not test a five-pound chicken after it has been cooking fifteen minutes to see if it is done.

Peas, beans, potatoes, corn, onions, rice, turnips, beets, cabbage, and macaroni should, when boiled, be done in from twenty to thirty minutes. The

surest test is to taste them. They will be burned in that many seconds, if you allow the water to boil off or put them in the middle of a smoky fire where they cannot be watched.

Fried things are the easiest to cook because you can tell when they are done more easily. Fried food however is always objectionable and as little of it should be eaten as possible. You are not much of a camp cook if a frying pan is your only tool.

A bottle of catsup or some pickles will often give just the right taste to things that otherwise seem to be lacking in flavour.

In frying fish, always have the pan piping hot. Test the grease by dropping in a bread crumb. It should quickly turn brown. "Piping hot" does not mean smoking or grease on fire. Dry the fish thoroughly with a towel before putting them into the pan. Then they will be crisp and flaky instead of grease-soaked. The same rule is true of potatoes. If you put the latter on brown butcher's paper when they are done, they will be greatly improved.

Nearly every camper will start to do things away from home that he would never think of doing under his own roof. One of these is to drink great quantities of strong coffee three times a day. If you find

that after you turn in for the night, you are lying awake for a long time watching the stars and listening to the fish splashing in the lake or the hoot owl mournfully "too-hooing" far off in the woods, do not blame your bed or commence to wonder if you are not getting sick. Just cut out the coffee, that's all.

V

WOODCRAFT

The use of an axe and hatchet — Best woods for special purposes — What to do when you are lost — Nature's compasses

THE word "woodcraft" simply means skill in anything which pertains to the woods. The boy who can read and understand nature's signboards, who knows the names of the various trees and can tell which are best adapted to certain purposes, what berries and roots are edible, the habits of game and the best way to trap or capture them, in short the boy that knows how to get along without the conveniences of civilization and is self-reliant and manly, is a student of woodcraft. No one can hope to become a master woodsman. What he learns in one section may be of little value in some other part of the country.

A guide from Maine or Canada might be comparatively helpless in Florida or the Tropics, where the vegetation, wild animal life, and customs of the woods are entirely different. Most of us are hopeless tenderfeet anywhere, just like landlubbers on shipboard. The real masters of woodcraft — In-

dians, trappers, and guides — are, as a rule, men who do not even know the meaning of the word "woodcraft."

Some people think that to know woodcraft, we must take it up with a teacher, just as we might learn to play golf or tennis. It is quite different from learning a game. Most of what we learn, we shall have to teach ourselves. Of course we must profit from the experience and observation of others, but no man's opinion can take the place of the evidence of our own eyes. A naturalist once told me that chipmunks never climb trees. I have seen a chipmunk on a tree so I know that he is mistaken. As a rule the natives in any section only know enough woods-lore or natural history to meet their absolute needs. Accurate observation is, as a rule, rare among country people unless they are obliged to learn from necessity. Plenty of boys born and raised in the country are ignorant of the very simplest facts of their daily experience. They could not give you the names of a dozen local birds or wildflowers or tell you the difference between a mushroom and a toadstool to save their lives.

On the other hand, some country boys who have kept their ears and eyes open will know more about the wild life of the woods than people who attempt to write

books about it; myself, for example. I have a boy friend up in Maine who can fell a tree as big around as his body in ten minutes, and furthermore he can drop it in any direction that he wants to without leaving it hanging up in the branches of some other tree or dropping it in a soft place where the logging team cannot possibly haul it out without miring the horses. The stump will be almost as clean and flat as a saw-cut. This boy can also build a log cabin, chink up the cracks with clay and moss and furnish it with benches and tables that he has made, with no other tools than an axe and a jackknife. He can make a rope out of a grape-vine or patch a hole in his birch bark canoe with a piece of bark and a little spruce gum. He can take you out in the woods and go for miles with never a thought of getting lost, tell you the names of the different birds and their calls,

The wilderness traveller

what berries are good to eat, where the partridge nests or the moose feeds, and so on. If you could go around with him for a month, you would learn more real woodcraft than books could tell you in a lifetime. And this boy cannot even read or write and probably never heard the word "woodcraft." His school has been the school of hard knocks. He knows these things as a matter of course just as you know your way home from school. His father is a woodchopper and has taught him to take care of himself.

If you desire to become a good woodsman, the first and most important thing is to learn to use an axe. Patent folding hatchets are well enough in their way, but for real woodchopping an axe is the only thing. One of four pounds is about the right weight for a beginner. As it comes from the store, the edge will be far too thick and clumsy to do good work. First have it carefully ground by an expert and watch how he does it.

If I were a country boy I should be more proud of skilful axemanship than to be pitcher on the village nine. With a good axe, a good rifle, and a good knife, a man can take care of himself in the woods for days, and the axe is more important even than the rifle.

The easiest way to learn to be an axeman is to make the acquaintance of some woodchopper in your neighbourhood. But let me warn you. Never ask him to lend you his axe. You would not be friends very long if you did. You must have one of your own, and let it be like your watch or your toothbrush, your own personal property.

A cheap axe is poor economy. The brightest paint and the gaudiest labels do not always mean the best steel. Your friend the woodchopper will tell you what kind to buy in your neighbourhood. The handle should be straight-grained hickory and before buying it you will run your eye along it to see that the helve is not warped or twisted and that there are no knots or bad places in it. The hang of an axe is the way the handle or helve is fitted to the head. An expert woodchopper is rarely satisfied with the heft of an axe as it comes from the store. He prefers to hang his own. In fact, most woodchoppers prefer to make their own axe handles.

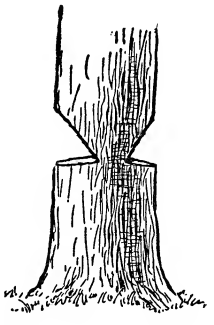
You will need a stone to keep a keen edge on the axe. No one can do good work with a dull blade, and an edge that has been nicked by chopping into the ground or hitting a stone is absolutely inexcusable.

To chop a tree, first be sure that the owner is willing to have it chopped. Then decide in which direction you wish it to fall. This will be determined by the kind of ground, closeness of other trees, and the presence of brush or undergrowth. When a tree has fallen the woodchopper's work has only begun. He must chop off the branches, cut and split the main trunk, and either make sawlogs or cordwood lengths. Hence the importance of obtaining a good lie for the tree.

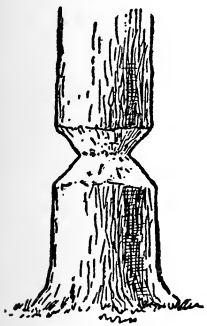
Before beginning to chop the tree, cut away all the brush, vines, and undergrowth around its butt as far as you will swing the axe. This is very important as many of the accidents with an axe result from neglect of this precaution. As we swing the axe it may catch on a bush or branch over our head, which causes a glancing blow and a possible accident. Be careful not to dull the axe in cutting brush. You can often do more damage to its edge with undergrowth no thicker than one's finger than in chopping a tree a foot through. If the brush is very light, it will often be better to use your jack-knife.

In cutting a tree, first make two nicks or notches in the bark on the side to which you wish it to fall and as far apart as half the diameter of the tree.

Then begin to swing the axe slowly and without trying to bury its head at every blow and prying it loose again, but with regular strokes first across the grain at the bottom and then in a slanting direction at the top. The size of the chips you make will be a measure of your degree of skill. Hold the handle rather loosely and keep your eye on the place you wish to hit and not on the axe. Do not work around the tree or girdle it but keep right at the notch you are making until it is half way through the tree. Do not shift your feet at every blow or rise up on your toes. This would tire even an old woodchopper in a short time. See that you do not set yourself too fast a pace at first. A beginner always starts with too small a notch. See to it that yours is wide enough in the start.



The right way to chop a tree — make two notches on opposite sides



The wrong way — this looks like the work of a beaver

When you have cut about half way through, go

to the other side of the tree and start another notch a little higher than the first one. A skilled man can chop either right- or left-handed but this is very difficult for a beginner. If you are naturally right-handed, the quickest way to learn left-handed wood chopping is to to study your usual position and note where you naturally place your feet and hands. Then reverse all this and keep at it from the left-handed position until it becomes second nature to you and you can chop equally well from either position. This you may learn in a week or you may never learn it. It is a lot easier to write about than it is to do.

When the tree begins to creak and show signs of toppling over, give it a few sharp blows and as it falls jump sideways. Never jump or run backward. This is one way that men get killed in the woods. A falling tree will often kick backward like a shot. It will rarely go far to either side. Of course a falling tree is a source of danger anyway, so you must always be on your guard.

If you wish to cut the fallen tree into logs, for a cabin, for instance, you will often have to jump on top of it and cut between your feet. This requires skill and for that reason I place a knowledge of axemanship ahead of anything else in woodcraft

except cooking. With a crosscut saw, we can make better looking logs and with less work.

Next to knowing how to chop a tree is knowing what kind of a tree to chop. Different varieties possess entirely different qualities. The amateur woodchopper will note a great difference between chopping a second growth chestnut and a tough old apple tree. We must learn that some trees, like oak, sugar maple, dogwood, ash, cherry, walnut, beech, and elm are very hard and that most of the evergreens are soft, such as spruce, pine, arbor vitæ, as well as the poplars and birches. It is easy to remember that lignum vitæ is one of the hardest woods and arbor vitæ one of the softest. Some woods, like cedar, chestnut, white birch, ash, and white oak, are easy to split, and wild cherry, sugar maple, hemlock, and sycamore are all but unsplitable. We decide the kind of a tree to cut by the use to which it is to be put. For the bottom course of a log cabin, we place logs like cedar, chestnut, or white oak because we know that they do not rot quickly in contact with the ground. We always try to get straight logs because we know that it is all but impossible to build a log house of twisted or crooked ones.

It is a very common custom for beginners to make

camp furniture, posts, and fences of white birch. This is due to the fact that the wood is easily worked and gives us very pretty effects. Birch however is not at all durable and if we expect to use our camp for more than one season we must expect to replace the birch every year or two. Rustic furniture made of cedar will last for years and is far superior to birch.

Getting lost in the woods may be a very serious thing. If you are a city boy used to signboards, street corners, and familiar buildings you may laugh at the country boy who is afraid to go to a big city because he may get lost, but he knows what being lost means at home and he fails to realize when he is in a city how easy it is to ask the nearest policeman or passer-by the way home. Most city boys will be lost in the woods within five minutes after they leave their camp or tent. If you have no confidence in yourself and if you are in a wilderness like the North woods, do not venture very far from home alone until you are more expert.

It is difficult to say when we are really lost in the woods. As long as we think we know the way home we are not lost even if we may be absolutely wrong in our opinion of the proper direction. In such a case we may soon find our mistake and get on the

right track again. When we are really lost is when suddenly a haunting fear comes over us that we do not know the way home. Then we lose our heads as well as our way and often become like crazy people.

A sense of direction is a gift or instinct. It is the thing that enables a carrier pigeon that has been taken, shut up in a basket say from New York to Chicago, to make a few circles in the air when liberated and start out for home, and by this sense to fly a thousand miles without a single familiar landmark to guide him and finally land at his home loft tired and hungry.

No human being ever had this power to the same extent as a pigeon, but some people seem to keep a sense of direction and a knowledge of the points of compass in a strange place without really making an effort to do it. One thing is sure. If we are travelling in a strange country we must always keep our eyes and ears open if we expect to find our way alone. We must never trust too implicitly in any "sense of direction."

Forest travellers are always on the lookout for peculiar landmarks that they will recognize if they see them again. Oddly shaped trees, rocks, or stumps, the direction of watercourses and trails, the position of the sun, all these things will help

us to find our way out of the woods when a less observing traveller who simply tries to remember the direction he has travelled may become terrified.

Rules which tell people what to do when they are lost are rarely of much use, because the act of losing our way brings with it such a confusion of mind that it would be like printing directions for terror stricken people who are drowning.

Suppose, for example, a boy goes camping for a week or two in the Adirondacks or Maine woods. If he expects to go about alone, his first step should be to become familiar with the general lay of the land, the direction of cities, towns, settlements, mountain ranges, lakes, and rivers in the section where he is going, and especially with the location of other camps, railroads, lumber camps, and so on in his immediate neighbourhood, say within a five-mile radius. It is an excellent plan to take along a sectional map which can usually be bought of the state geologist. One can by asking questions also learn many things from the natives.

Such a boy may start out from his camp, which is on the shore of a lake, for example, on an afternoon's fishing or hunting trip. If he is careful he will always consult his compass to keep in mind the general direction in which he travels. He will

also tell his friends at camp where he expects to go. If he has no compass, he at least knows that the sun rises in the east and sets in the west and he can easily remember whether he has travelled toward the setting sun or away from it. Rules for telling the points of compass by the thickness of the bark or moss on trees are well enough for story books. They are not of much value to a man lost in the woods.

Suddenly, say at four o'clock, this boy decides to "turn around" and go back to camp. And then the awful feeling comes to him that he doesn't know which way to turn. The woods take on a strange and unfamiliar look. He is lost. The harder he tries to decide which way the camp lies, the worse his confusion becomes. If he would only collect his thoughts and like the Indian say "Ugh! Indian not lost, Indian here. Wigwam lost," he probably would soon get his bearings. It is one thing to lose your way and another to lose your head.

When you are lost, you are confused, and the only rule to remember is to sit down on the nearest rock or stump and wait until you get over being "rattled." Then ask yourself, "How far have I gone since I was not sure of my way?" and also,

"How far am I from camp?" If you have been out three hours and have walked pretty steadily, you may have gone five miles. Unless you have travelled in a straight line and at a rapid pace, the chances are that you are not more than half that distance. But even two or three miles in strange woods is a long distance. You may at least be sure that you must not expect to find camp by rushing about here and there for ten minutes.

We have all heard how lost people will travel in circles and keep passing the same place time after time without knowing it. This is true and many explanations have been attempted. One man says that we naturally take longer steps with our right leg because it is the stronger; another thinks that our heart has something to do with it, and so on. Why we do this no one really knows, but it seems to be a fact. Therefore, before a lost person starts to hunt for camp, he should blaze a tree that he can see from any direction. Blazing simply means cutting the bark and stripping it on all four sides. If you have no hatchet a knife will do, but be sure to make a blaze that will show at some distance, not only for your own benefit but to guide a searching party that may come out to look for you. You can mark an arrow to point the direction that you

are going, or if you have pencil and notebook even leave a note for your friends telling them your predicament. This may all seem unnecessary at the time but if you are really lost, nothing is unnecessary that will help you to find yourself.

As you go along give an occasional whack at a tree with your hatchet to mark the bark or bend over the twigs and underbrush in the direction of your course. The thicker the undergrowth the more blaze marks you must make. Haste is not so important as caution. You may go a number of miles and at the end be deeper in the woods than ever, but your friends who are looking for you, if they can run across one of your blazes, will soon find you.

When you are certain that you will not be able to find your way out before dark, there is not much use of going any farther. The thing to do then is to stop and prepare for passing the night in the woods while it is still daylight. Go up on the highest point of ground, build a leanto and make your campfire. If you have no matches, you can sometimes start a fire by striking your knife blade with a piece of flint or quartz, a hard white stone that is common nearly everywhere. The sparks should fall in some dry tinder or punk and the little fire coaxed along

until you get a blaze. There are many kinds of tinder used in the woods, dried puff balls, "dotey" or rotten wood that is not damp, charred cotton cloth, dry moss, and so on. In the pitch pine country, the best kindlings after we have caught a tiny blaze are splinters taken from the heart of a decayed pine log. They are full of resin and will burn like fireworks. The Southerners call it "light-wood."

Dry birch bark also makes excellent kindlings. A universal signal of distress in the woods that is almost like the flag upside down on shipboard is to build two smoky fires a hundred yards or more apart. One fire means a camp, two fires means trouble.

Another signal is two gunshots fired quickly, a pause to count ten and then a third. Always listen after you have given this signal to see if it is answered. Give your friends time enough to get the gun loaded at camp. Always have a signal code arranged and understood by your party before you attempt to go it alone. You may never need it but if you do you will need it badly.

Sometimes we can get our bearings by climbing a tree. Another aid to determine our direction is this: Usually all the brooks and water courses near a large lake or river flow into it. If you are

sure that you haven't crossed a ridge or divide, the surest way back home if camp is on a lake is to follow down the first brook or spring you come across. It will probably bring you up at the lake, sooner or later.

On a clear night you can tell the points of compass from the stars. Whether a boy or girl is a camper or not, they surely ought to know how to do this. Have some one point out to you the constellation called the "dipper." It is very conspicuous and when you have once learned to know it you will always recognize it as an old friend. The value of the dipper is this: The two stars that form the lower corners of its imaginary bowl are sometimes called the "north star pointers." The north star or Polaris, because of its position with reference to the earth, never seems to move. If you draw an imaginary line through the two pointers up into the heavens, the first bright star you come to, which is just a little to the right of this line, is the north star. It is not very bright or conspicuous like Venus or Mars but it has pointed the north to sailors over the uncharted seas for hundreds of years. By all means make the acquaintance of Polaris.

VI

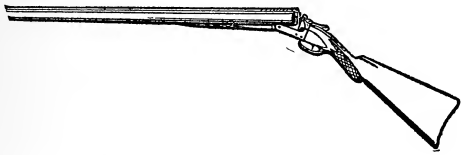
THE USE OF FIRE-ARMS

Importance of early training — Why a gun is better than a rifle — How to become a good shot

WHETHER a boy of fifteen should have a gun or a rifle is a question that parents will have to settle for themselves. There is no question but that a careful boy who has been taught by some older person how to handle a gun is more to be trusted than a man who has never learned the proper use of fire-arms and who takes up the sport of hunting after he is grown up. Most of the shooting accidents are caused by inexperienced men who have never been accustomed to guns in their younger days. Once or twice I have just missed being shot by friends who had never been hunting before, and who became so excited when they unexpectedly kicked up a rabbit or walked into a flock of quail that they fired the gun without knowing whether any of their friends were in range or not. When a boy is allowed to have a gun it should be a real one. Air rifles and small

calibre guns are all the more dangerous, because they are often looked upon as toys.

In handling a gun, always treat it as though it were loaded, no matter if you *know* it is empty. By this means it will soon become second nature to you never to point the gun at any one even carelessly or in fun. A guide once said to me, "A gun is a dangerous critter without lock, stock, or barrel,



A double barrelled hammerless shot-gun

and if a feller ever points one at me I think he means business."

A gun can never be trusted. Accidents happen so quickly that it is over before we know it and the terrible damage is done. Sometimes the trigger will catch on a coat button or a twig, and, bang! an unexpected discharge takes place and if you were careless just for an instant, it may cost some one his life. Especial care must be taken in loading and unloading a gun. It is at this time that a gun is most likely to go off unexpectedly.

The best way to learn how to handle a gun is to

watch the methods of an old hand. Never fire a gun when you are standing behind another person. You may know that you are not aiming at him, but the concussion of the air near the end of the barrel is terrific, and your friend may have a split ear drum as a result.

A shot-gun is better for a boy than a rifle, for the reason that most real shooting except for big game is done with a shot-gun, and besides, it takes a lot of practice to shoot well with it. A shot-gun is not a weapon for play but a real tool. In almost every section of the country there is some small game to be hunted and there is usually also an opportunity to practise at clay pigeons.

No one would think of hunting quail, ducks, or rabbits with a rifle, and even if you were an excellent rifle shot at a still mark you might not be able to hit moving game at all. A shot-gun is less dangerous for the reason that its range is limited to a little over a hundred yards, while a rifle may carry a mile. A cheap shot-gun is far more dangerous than a cheap rifle. Until it is possible to buy a good one it is better to have none at all. A good American-made gun can be bought for about twenty-five dollars. A gun suitable for its owner should fit just as his clothing fits him. When a

gun is quickly brought to the shoulder in firing position, there is no time in actual hunting to shift it around. When you buy a gun, remember that your canvas or corduroy hunting coat makes more of a bulge at the shoulder than an ordinary suit and accordingly see that the stock is the proper length. The "drop" of a gun is the number of inches that the stock falls below the line of the barrel. If the stock is bent too much you will shoot under your game. If it is too straight the tendency will be to shoot over game. The average stock is made to fit most people and will probably answer most purposes unless you can afford to have a stock made especially. The principal thing is to do all your practising with your own gun until it becomes second nature to bring it up quickly and have the eye find the barrel instantly. A shot-gun is not aimed in the same way as a rifle. The method of good shots is rather to keep their eye on the game and when they "feel" that the gun is pointed right to fire. A skilful shot can tell whether he is shooting too high or too low just as he pulls the trigger. The brain, head, and eyes and trigger-finger must all work in harmony or you will never be a good shot. Never flinch as you shoot. This is a very common fault of beginners and it is fatal to becoming a marksman.

The first lesson in handling a gun is to understand perfectly how it works. If it is a hammerless gun, remember that it is always cocked. When you open the barrels you cock the gun automatically. For this reason there is some kind of a safety device provided, which should always be left at "safe" except at the actual instant of firing. It is just as easy to learn to push the safety off when you fire as it is to learn to pull the trigger, if one starts right.

Never carry your gun with your finger on the trigger. Wait until you put the gun up as you are ready to shoot. Don't forget the safety. A great many shots are missed because the hunter forgets whether he has left it on or off and in his anxiety to hit the game will tug and pull on the trigger until, just as the game disappears out of range, he will remember that he did not release it. This shows the importance of acquiring the proper habit at first.

It is harder to correct bad habits in handling a gun than to teach the beginner the proper way at first. On your first lesson in the field, walk on the left side of your teacher so that your gun will be pointing away from him. If you come across any game, try to take your time before you fire. Nearly

every one shoots too quickly. As most shot-gun shooting is what is called snap shooting, there isn't much time at best, but a good shot will be sure that he has covered his game before he fires, while a beginner will trust to luck. This will be the hardest fault to correct. Consequently a beginner should if possible hunt alone for a while, as the presence of another gun alongside of him makes him too anxious to get in the first shot, and gets him into bad habits.

If your teacher also has a gun, he must assure you that he does not intend to shoot and then you will try harder to get the game and run less chance of missing. Always unload a gun before going into a house, under or over a fence, or in or out of a boat or carriage. If you leave your gun, even for a minute, unload it. Never rest a loaded gun against a tree or building. Never pull a gun loaded or empty toward you by the muzzle. In unloading always point it toward the ground. A jar will sometimes discharge a gun and very often a discharge will take place when closing the breech on a tight shell.

Always be ready for game. In hunting, we never can tell at what instant it will rise up in front of us. "Be ready" does not mean having the muscles and nerves constantly on a tension. It is simply

to carry your gun in such a position that you can quickly bring it to the shoulder at any time. It is a good plan to practise aiming at various objects as you go along until you gradually overcome your awkwardness.

It is difficult to say what makes a good shot with a gun. There is no question but that practice will make any one a better shot than he would be without it, but some people are better shots with very little practice than others with a great deal. One very important thing is to do your practising under conditions similar to the actual hunting. If the cover is thick where you hunt, a swamp or brush lot for example, you will not derive much benefit from practising entirely in the open. A pigeon trap is an inexpensive way to learn to shoot. Some experienced hunters will say that practice at clay pigeons does not help in the field, but at the same time a good brush shot is almost always a good trap shot and if you can become skilful enough to break an average of eighteen to twenty clay pigeons out of twenty-five at sixteen yards rise, you may be sure that you will get your share of game under actual hunting conditions.

The most difficult part of bird hunting is to learn to give the game a start. The average shot-gun

will kill quail at sixty yards and duck at forty. The farther the game is away from us, provided it is within range, the more the shot will spread. I once saw a half-dozen hunters fire at a covey of quail that rose in an open field before they had gone thirty yards and every hunter scored a clean miss. Any one of these men could bring down his bird under the same conditions nine times out of ten if he had taken his time. On this occasion when their guns were empty another hunter who had withheld his fire said, "Are you all done, boys?" and shot a bird with each barrel at a measured fifty-eight yards. To kill a bird that another man has shot at is called "wiping his eye," and it is the chief joy of an old hunter to do this with a beginner. If you do not want to let the old hunter wipe your eye, take your time.

Learn to shoot with your head well up and with both eyes open. When the game rises, keep your eye on it and at the instant that you see it on the end of your gun barrel, fire. The greatest joy of hunting is to see the game appear to tumble off the end of your gun barrel when it is hit. If there is a doubt as to whose bird it is, and this happens constantly as two people often shoot at the same time at the same bird, do not rush in and claim it. Re-

member you are a gentleman, but if you are sure that you hit it, at least stand for your rights.

So much of the pleasure of hunting depends on our companions that we must be considerate of the feelings of others as well as our own. Always hunt if possible with experienced hunters. You will not only have more fun, but you will run much less risk. In rabbit hunting, one is especially at the mercy of the beginner who fires wildly without any thought as to whose life he may be endangering, so long as he gets the rabbit. If you hunt with some one who owns the dogs, be very careful not to interfere with them by giving commands. As a rule the owner of a well-trained dog prefers to handle him without any help, and, while he may not tell you, you may be sure that he will resent it if you try to make the dog do your bidding when his master is around.

The pattern of a gun, as it is called, is the number of shot it will put within a circle at a given distance. As a rule the factory test pattern will be found on a tag attached to the gun. If not, you can easily get the pattern yourself. The usual distance for targeting a new gun is thirty yards, and the standard circle is thirty inches. Make a circle on the barn door with a piece of chalk and string fifteen inches

long. First drive a nail into the wood and fasten the string to it with the chalk on the loose end. Then describe and measure ninety feet from the target. Fire as nearly as you can at the centre of the circle and count the shot that are inside the chalk mark. In order not to count the same shot twice mark them off with a pencil. Perhaps a surer way would be to fire at the door first and in the centre of the load of shot drive the nail and describe a circle afterward. The chief advantage of studying the pattern of your gun is to know just how much it scatters and how far it may be depended upon to shoot and kill.

In a choke-bore gun, the end of the barrel is drawn in slightly and made smaller to keep the shot together. Guns that are used in duck and goose hunting are usually full choked as most of the shots are long ones, but for ordinary brush and field shooting a gun that has a full cylinder right barrel and a modified choke on the left will be the best for general purposes.

The best size is 12-bore or gauge. Ten gauge guns are entirely too heavy for general use and the smaller bores, such as sixteen or even twenty gauge, while they are very light and dainty, are not a typical all around gun for a boy who can only afford

to have one size. The smaller bores, however, have become very popular in recent years and much may be said in their favour.

The standard length of barrels is either twenty-eight or thirty inches. The shorter length will probably be just as satisfactory and makes a much better proportion between the stock and barrels. You can easily test the amount of choke in a 12-gauge gun. A new ten-cent piece will just go inside the end of the barrel of a full cylinder gun and just fail to go into one that has been slightly choked.

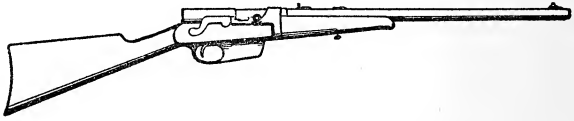
While it is impossible to give any written directions for shooting that are as valuable as actual practice, the important thing for a beginner is to get his form right at first, just as in golf or horseback riding, and then to make up his mind that every shot has got to count.

Rifle shooting is entirely different from shot-gun shooting and skill in one branch of the sport of marksmanship does not mean much in the other. A boy may be an excellent rifle shot at a stationary target and still not be able to hit "a flock of barns," as the country boys say, with a shot-gun. Skill with a rifle is chiefly of value to those who are interested in military affairs and more rarely to those who are fortunate enough to have an opportunity

for hunting big game. In settled communities there is a strong feeling against allowing boys to have rifles. Practically the only game that can be hunted will be our little friends, the song birds, and no self-respecting boy will shoot them. A small calibre rifle such as a 22-calibre Flobert will afford considerable pastime at target practice and is also excellent to hunt snakes and frogs along some brook or creek, but generally a boy with a rifle is a public nuisance, and as a rule is liable to arrest in possessing it. If we fix up a rifle range where there are no dangers of damage from spent bullets or badly aimed shots it is well enough to practise with a small rifle.

A real sporting rifle, such as is used for big game, is a very dangerous fire-arm and cannot be used with safety anywhere but in an absolute wilderness or on a target range. Such guns will kill at a mile and go through a tree a foot or two in diameter; to use such a weapon in even a sparsely settled section is very dangerous indeed. If a boy has any chance of going hunting for deer or moose, he will surely need practice and for this purpose a range will have to be selected where there is absolutely no danger to any one within a mile or two. A good practice range is across a lake or river with a bank

of earth or clay to stop the bullets. Big game hunting is done so frequently from canoes that it is well to get practice from a boat, both moving and stationary. To shoot successfully from a sitting position in a canoe is a very difficult feat. Just as with a shot-gun the universal tendency is to shoot too quickly, with a rifle it is to shoot too high. The reason is that we hold our head so high up in looking at our game that we fail to see the rear



The modern sporting rifle that will kill at a mile. An unsafe weapon for boys

sight at all. Be sure your head is low enough to see both sights.

Always hold your breath while you are taking aim. Learn to shoot from all sorts of positions, lying, sitting, kneeling, and standing. If the shot is a long one, be sure that your rear sight is properly elevated for the distance. Most of the shots at big game are stationary shots and within a hundred yards; consequently accuracy counts for more than quickness.

With a magazine or repeating rifle be sure that

you have emptied your magazine before you leave the gun. With a shot-gun there is a possibility that the "person who didn't know it was loaded" may not kill his victim outright. With a sporting rifle it is practically sure death.

The general rules of care apply to both rifles and shot-guns. Always clean the gun after you have taken it into the field. This is necessary whether you have fired the gun or not, as a gun barrel will always collect a certain amount of dampness. It is an excellent practice to keep a gun covered with oil or vaseline except when it is in use. It not only prevents rust, but the grease also discourages visitors and friends from handling the gun, snapping the trigger, or otherwise damaging it.

In this chapter, I have not said anything about revolvers or pistols, because I do not believe that any sensible boy will care to own one. A revolver is a constant source of danger owing to its short barrel, and as it has no practical value except as a weapon of defence, and as there is a severe penalty for carrying a concealed weapon, I should not care to recommend any boy to own a revolver.

The final question whether we may have a gun and what kind it should be, will depend very largely on the place we live. Any kind of a gun is very

much out of place in cities or towns. The boy who does not really have an opportunity to use a gun should be too sensible to ask for one, for surely if we own it we shall constantly want to use it even at some risk. It will be far better to ask for something we can use and leave the gun question until the time when we have a real opportunity.

Finally we must remember that the one who has the gun in his possession is rarely the one that is accidentally shot. We should therefore avoid companions who do own guns and who are careless with them. No amount of care on our part will prevent some careless boy friend from risking our lives. The safer way is to stay home.

VII

FISHING

Proper tackle for all purposes — How to catch bait — The fly fisherman — General fishing rules

FISHING is one sport of boyhood that we never outgrow our love for. Some of the most enthusiastic fishermen are gray-haired men. We often hear about the boy with the bent pin and the piece of thread who catches more fish than the expert fisherman with modern, up-to-date tackle, but I doubt if it is so. As a rule the better our tackle the more fish we shall catch. If the country boy catches the most fish, it is simply because he is better acquainted with the places where the fish hide or feed. He knows their habits better and the best kind of bait to use. A lover of fishing should take a personal interest in his equipment and should desire to have the best he can afford.

The chief requirement of a successful fisherman is patience. Next to that is a knowledge of the waters fished in and the habits of the fish and how to attract them. A man or a boy who will sit all day in the

hot sun waiting for a bite is not always a good fisherman. He must use common sense as well as patience.

A game fish may be defined as one that will make a good fight for its life and that is caught by scientific methods of angling. Almost any fish will struggle to escape the hook, but generally by game fish we understand that in fresh water the salmon, bass, or trout family is referred to. Pickerel and pike are also game fish, but in some sections they are considered undesirable because they rarely rise to the fly, which is the most scientific method of fishing.

A fisherman who is a real sportsman always uses tackle as light as he can with safety and still have a chance of landing the fish. If the angler will take his time he can, with skill, tire out and land fish of almost any size. Tunas and tarpon weighing over a hundred pounds are caught with a line that is but little thicker than a grocer's twine, and even sharks and jewfish weighing over five hundred pounds have been caught in the same way. Sometimes the fight will last all day, and then it is a question whether the fisherman or the fish will be exhausted first.

In selecting our tackle, we must always keep in mind the kind of fish we expect to catch. For

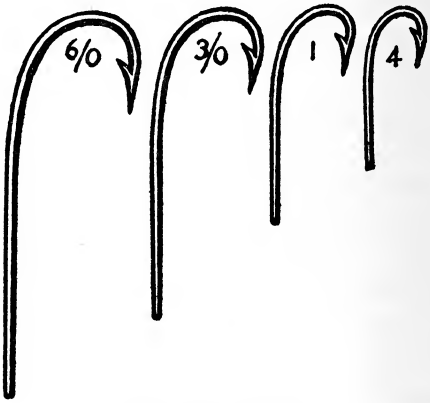
Fishing is the One Sport of Our Childhood That Holds Our Interest Through Life

general, fresh-water use, except fly casting, an eight-foot rod weighing seven or eight ounces will fill most purposes. A fly rod should be a foot longer and at least two ounces lighter. The best rods are made of split bamboo, but cheap rods of this material are not worth having. The best cheap rods (i.e., costing five dollars or less) are either lancewood or steel. See that your rod has "standing guides" and not movable rings. Most of the wear comes on the tip, therefore it should if possible be agate lined. A soft metal tip will have a groove worn in it in a very short time which will cut the line. The poorest ferrules are nickel-plated. The best ones are either German silver or brass. To care for a rod properly, we must keep the windings varnished to prevent them from becoming unwound. Spar varnish is the best for this purpose but shellac will answer. In taking a rod apart, never twist it. Give a sharp pull, and if it refuses to budge, it can sometimes be loosened by slightly heating the ferrule with a candle. If a ferrule is kept clean inside, and if the rod is taken apart frequently, there is no reason why it should stick.

A multipying reel holding sixty yards is large enough for most fishing. The raised pillar reels are the best, one of good quality costing about four dollars. A cheap reel soon goes to pieces.

Silk lines are better than linen because greater strength is obtained with the same thickness. Always dry a line every time it is used, or it will soon rot and be worthless. The back of a chair is excellent for this purpose. Never tie a knot in a line that you expect to use with rod and reel. The knot will always catch in one of the guides just at the time when you are landing your "biggest" fish.

Hooks come in a great variety of shapes and



Actual sizes of hooks

models but there are none better than the standard "Sproat." It is the general favourite of fishermen everywhere, although of course the other leading

models, Carlisle, Limerick, Pennell, Aberdeen, Sneck and a number of others all have their friends.

A great many fishermen make the mistake of using hooks that are too large. The hook sizes that are commonly used are numbered from 6/0, which is the largest, to No. 12, which is a tiny thing about right to catch minnows. Where we expect to catch fish a pound or two in weight, the No. 1 size is about right. Such a hook will catch much larger fish if they happen to come along. I have caught a twelve-pound lake trout on a No. 4 Sproat hook and the hook did not show that it had bent in the least.

Our tackle box should contain an assortment of sizes however. Snelled hooks are better than ringed hooks and those of blued steel better than black enamel. No matter how inexpensive the rest of the equipment is, be sure that your hooks are of good quality. Keep the points sharp. A tiny bit of oil stone, a file, or a piece of emery cloth are all good for this purpose. It takes a sharp point to penetrate the bony jaw of a fish. Always inspect your hook after you have caught it on a rock or snag.

Fishing is generally divided into four classes: fly casting, bait casting, trolling, and still fishing. The average boy is a still fisherman, which means

not only that he must keep still, but that his bait remains in one place instead of being trolled or cast about. The usual strings of fish that boys catch, such as perch, sunfish, bullheads, catfish, and whitefish, are called pan fish. This is not entirely a correct name as I have seen some catfish that it would take a pretty big pan to hold. One caught in the Mississippi River weighed over a hundred pounds.

Fly casting is the most scientific method of fishing and gives the greatest pleasure to the fisherman after he has once become an expert. No matter what method we follow in fishing, we must never try to catch fish by any method which the laws may prohibit, such as spearing, set lines, or nets. Each state has its own laws which the fisherman must learn and obey.

Worms are the best all around bait for fishing. They are as a rule easily obtained and may be kept for a long time. The boy's method of placing them in a tin can with a mixture of mud will soon kill them, however, especially if the worms are exposed to the sun for a time. A half-buried soap box makes a very good place to keep a supply of worms which will be ready for use at any time without the necessity of digging them. Worms may be fed on the white of a hard-boiled egg, but if given plenty of

room they will usually find enough food in the soil. By placing worms in sand they will soon scour and turn pink when they are far more attractive as bait. The large worms, or "night walkers," can be caught at night with a lantern. These large worms are best obtained after a rain or on lawns that are sprinkled frequently, when they will be found moving about on top of the ground but always with one end in the hole from which they have emerged and into which they can dart if they are disturbed.

For big fish, the best bait is minnows. In trolling with them it will make but little difference whether dead or alive, but for still fishing the minnows must not only be alive, but, to attract the fish, lively as well. The regulation minnow bucket consists of one pail fitted inside of another, the inner one being made of wire mesh to permit the free circulation of the water. This enables us to change the water frequently without handling the fish. When we reach a place where fresh water is obtainable, we simply remove the inner pail, pour out the stale water from the other pail, and fill it as quickly as possible. To keep bait alive in warm weather we must change the water frequently. Another method where fresh water is not available, as on a long drive, is to aerate it by pouring from one pail to another. It is an

excellent plan to place a piece of ice on top of the minnow pail. With this arrangement, it will not be necessary to give them fresh water for a long time.

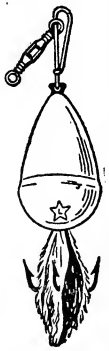
The simplest way to catch minnows is with a drop net. Take an iron ring or hoop such as children

An excellent device for catching minnows

use and sew to it a bag of cotton mosquito netting, half as deep as the diameter of the ring. Sew a weight in the bottom of the net to make it sink

readily and fasten it to a pole. When we reach the place which the minnows frequent, such as the cove of a lake, we must proceed very cautiously, lowering the net into the water and then baiting it with bits of bread or meat, a very little at a time, until we see a school of bait darting here and there over the net. We must then give a quick lift without any hesitation and try to catch as many as possible from escaping over the sides. The minnow bucket should be close at hand to transfer them to and care must be used not to injure them or allow them to scale themselves in their efforts to escape. The common method of capturing minnows is to use a sweep net, but it takes several people to handle one properly and for our own use the drop net method will probably supply us with all the bait that we need.

Fish are very fickle in their tastes. What will be good bait one day will absolutely fail the next and sometimes even in an hour this same thing will take place. Why this is so no one has been able to explain satisfactorily, but that it is a fact no fisherman will deny. We should therefore have as great a variety of bait in our equipment as possible.



A trolling spoon

Worms, crawfish, minnows, frogs, grasshoppers, grubs and helgramites are all good at times in fresh water, as well as various kinds of artificial baits, spoons, spinners, and rubber lures.

Sometimes fish will take very unusual baits. Black bass have been caught on young bats. The famous old trout in the Beaverkill River in New York State, which had refused all the ordinary baits and flies that were offered him for years and that on bright days could be seen in a pool lying deep down in the water, finally fell a victim to a young mouse that was tied to the hook with pink silk.

Fly fishing is the most expert and scientific method of angling. It is the poetry of fishing. The fly fisherman usually wades in the brook or stream where he is fishing, although it is sometimes possible to cast a fly from the bank or a boat. It is useless to go fly fishing while there is snow water in the brooks but just as soon as the first warm days of spring come, then fishing is at its best.

The whole idea of casting a fly is to drop it in the most likely-looking places and to strike the fish just as soon as he seizes the hook. To do this we must always have the line under perfect control, therefore do not attempt to cast a line too great a distance. If we do not fix the hook into the

fish's mouth at the instant that he seizes the fly, he will very soon find that what he thought was a nice fat bug or juicy caterpillar is nothing but a bit of wool and some feathers with a sting in its tail, and he will spit it out before we can recover our slack line.

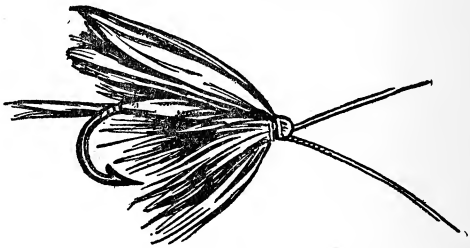
It is a common mistake to use flies that are too large. Ordinary trout flies are the proper size for bass and the smallest size trout flies are plenty large enough for trout. There are hundreds of kinds of flies of various combinations of colours and no one can say which is the best. This question has been argued by fishermen ever since the days of Izaak Walton.

The universal rule of trout and bass fishermen who use a fly is to select small dark flies for bright days or when the water is very clear or low and the more brightly coloured ones when the day is dark or the water dark or turbid. The fly book should contain a varied assortment to meet these conditions.

The best lines for fly fishing are made of braided enamelled silk. Some fly lines are tapered but this is not necessary and is a needless expense. Twisted lines are much cheaper but very unsatisfactory.

Fly fishing is not only the most scientific and sportsmanlike method of fishing but it is also the

most difficult to acquire skill in. It is of course possible to catch trout and salmon on other bait than flies. In fact, there is really no better bait for brook trout than common fish worms that have been scoured in sand. The use of a fly, however, is more satisfactory where the pleasure derived in fishing is more important than the size of the string.



An artificial fly; used for salmon

In learning to cast a fly, you can practise at home, either in an open space or wherever there is room to work the line. It is not necessary to practise with the actual hooks or flies on the line. Simply tie a knot in it. Hold the rod lightly but firmly in the right hand. Point your thumb along the line of the rod and start by pulling out a little line from the reel with the left hand. With a steady sweep, cast the end of the line toward some near-by object and with each cast pull out a little more line until you

reach a point when you are handling all the line you can take care of without effort or without too much of a sweep on the back cast. You must not allow the line to become entangled in trees or other obstacles. The wrist does most of the work in casting. The elbow should be close to the side. If you find that the line snaps like a whip on the back cast, it is because you start the forward cast before the line straightens out behind.

When you can handle twenty-five or thirty feet accurately, you can safely get ready to go fishing. The most successful fly fishermen use a short line, but they use it with the utmost accuracy and can make the flies land within a foot of the place they are aiming at almost every time. When a trout strikes your fly, you must snub him quickly or he will surely get away. If the flies you are using do not cause the fish to rise, and if you are certain that it is not due to your lack of skill, it will be well to change to some other combination of colours; but give your first selection a fair trial.

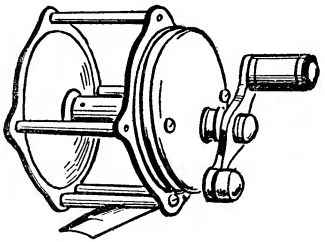
Bait casting is much easier than fly casting as the weight of the bait will help to carry out the line. It is the common method of fishing with minnows, frogs, small spoons and spinners, and other artificial lures. Some fishermen practise the method of allow-

ing the line to run from the reel. The principal point in this way of fishing is to stop the reel by using the thumb as a brake at the instant that the bait strikes the water. This prevents the reel from spinning and causing the line to overrun. Neglect of this precaution will cause a very annoying tangle that is sometimes call a "backlash" but more often characterized by much harsher names by the impatient fisherman who has the misfortune to experience it.

In live bait casting, start with the line reeled to within fifteen inches of the end of the rod, holding the thumb on the reel spool. With a rather strong overhead sweep, bring the rod forward. At the proper instant, which is just as the point of the rod goes over your head, release the pressure of your thumb and the bait will go forward as the line runs out rapidly. When the bait lands, reel in slowly and with various motions try to give to the bait as life-like an appearance as possible. If you have a strike, allow the fish sufficient time to obtain a secure hold of the bait and by a sudden jerk fix the hook in his mouth.

Bait casting is as a rule a very effective method of catching fish, especially in shallow lakes and where fly fishing is not practised. In deep water, trolling

or still fishing are usually the best methods of catching fish and often the only methods that will be successful. Trolling consists simply in rowing or paddling slowly with the bait or spoon trailing behind. It is not a scientific way of fishing and requires but little skill. When the fish strikes, it usually hooks itself and all that remains is to reel it into the boat and land it. The conditions on large lakes often make it necessary to follow one of these methods of trolling or still fishing, especially during the warm weather when the big fish have left the spawning grounds and are in deep water. There are trolling devices called spinners that have several gangs of hooks, sometimes as many as fifteen. No real fisherman would use such a murderous arrangement which gives the fish practically no chance at all and in many states their use is properly prohibited by law. A single hook, or at most a single gang of three hooks, is all that any one should ever use.



A raised pillar multiplying reel

Every boy knows what still fishing is. It is the common method of baiting our hook, casting it

from the shore or from a boat and waiting for a bite. In still fishing it is customary to use a light sinker to keep the bait near the bottom and a float or "cork" which serves the double purpose of keeping the bait away from snags, stones, or weeds on the bottom and also of showing us when we have a bite. The more expert still fishermen never use a float, as they prefer to tell by the pull on the line when a fish has taken the bait.

A fishing boat should be thoroughly seaworthy and also have plenty of room. Flat-bottom boats make the best type for fishing, provided that we do not have to row them far or if the place where we use them is not subject to sudden squalls or rough water. The middle seat should contain both a fish well and a minnow box with a dividing partition and with two hinged lids fitted into the seat. Such a boat can be built by an ordinary carpenter and should not cost over ten or twelve dollars. It should be painted every year to keep it in good condition. Use clear white pine or cedar for the sides. The bottom boards should not be fitted tightly together but left with cracks fully a half-inch wide to allow for the swelling of the wood when the boat is launched. The best oarlocks are fastened to the oars and fit in the sockets with a long pin. This arrange-

ment permits one to fish alone, and if trolling to drop the oars quickly and take up the rod without danger of losing them.

A landing net should be a part of every fishing outfit. More fish are lost just as they are about to be lifted from the water than at any other time. A gaff is used for this same purpose with fish too

A landing net should be a part of every fisherman's outfit

large to go into a landing net. A gaff is a large hook without a barb fastened into a short pole. If you have no net or gaff and have succeeded in bringing a large fish up alongside the boat, try to reach under him and get a firm grip in his gills before you lift him on board. If it is a pickerel, look out for his needle-like teeth.

The best time to fish is either in the early morning

or just before sundown. During the heated part of the day most game fish stop feeding and seek the cool, deep places in the lake or river.

In many states, fishing is prohibited by law until after the fish are through the spawning season.

In all kinds of fishing, the rule is to keep as quiet as possible. Talking does not make so much difference, but any sudden noises in the water or on the bottom of the boat are especially likely to frighten the fish.

Never fish in your own shadow or that of your boat. Try to have the sun in front of you or at your side.

Never be in a hurry to land a big fish. Remember that some of the so-called "big game fish" of the ocean will take all day to land. You must use skill to tire your fish out or by keeping his gills open to drown him. The rod and line are not intended as a lever to force the fish to the landing net but merely as a guide to lead him about and by his struggles to force him to become exhausted. A very interesting experiment has demonstrated that a skilful fisherman can with a fly rod and light line in a very short time tire out a strong swimmer to which the line has been attached and force him to give up the struggle and come to the side of a boat.

Methods of fishing differ so much in different localities that aside from the ordinary equipment of rods, reels, lines, leaders, and hooks, the fisherman going to a new locality had better first ascertain what the general methods of fishing are, or else, if possible, secure his equipment after he reaches his fishing grounds.

VIII

NATURE STUDY

What is a true naturalist? — How to start a collection — Moth collecting — The Herbarium

THERE is nothing in the world that will bring more pleasure into the life of a boy or girl than to cultivate a love for nature. It is one of the joys of life that is as free as the air we breathe. A nature student need never be lonely or at a loss for friends or companions. The birds and the bugs are his acquaintances. Whenever he goes afield there is something new or interesting to see and to observe. He finds—

"——*tongues in trees, books in the running brooks, Sermons in stones and good in everything.*"

To love nature and her mysteries does not necessarily mean to be some kind of a queer creature running around with a butterfly net or an insect box. A true naturalist is simply a man or boy who keeps his eyes and ears open. He will soon find that nature is ready to tell him many secrets. After a time, the smell of the woods, the chirp of a cricket

and the rustling of the wind in the pines become his pleasures.

The reason that people do not as a rule know more about nature is simply because their minds are too full of other things. They fail to cultivate the power of accurate observation, which is the most important thing of all. A practical start in nature study is to go out some dewy morning and study the first spider web you come across, noting how wonderfully this little creature makes a net to catch its food just as we make nets to catch fish, how the web is braced with tiny guy ropes to keep the wind from blowing it away in a way similar to the method an engineer would use in securing a derrick or a tall chimney. When a fly or bug happens to become entangled in its meshes, the spider will dart out quickly from its hiding place and if the fly is making a violent struggle for life will soon spin a ribbon-like web around it which will hold it secure, just as we might attempt to secure a prisoner or wild animal that was trying to make its escape, by binding it with ropes. A spider makes a very interesting pet and the surest way to overcome the fear that many people have of spiders is to know more about them.

There is no need to read big books or listen to dry lectures to study nature. In any square

foot that you may pick out at random in your lawn you will find something interesting if you will look for it. Some tiny bug will be crawling around in its little world, not aimlessly but with some definite purpose in view. To this insect the blades of grass are almost like mighty trees and the imprint of your heel in the ground may seem like a valley between mountains. To get an adequate idea of the myriads of insects that people the fields, we should select a summer day just as the sun is about to set. The reflection of its waning rays on their wings will show countless thousands of flying creatures in places where, if we did not take the trouble to observe, we might think there were none.

There is one very important side to nature that must not be overlooked. It consists in knowing that we shall find a thousand things that we cannot explain to one that we fully understand. Education of any kind consists more in knowing when to say "I don't know and no one else knows either" than to attempt a foolish explanation of an unexplainable thing.

If you ask "why a cat has whiskers," or why and how they make a purring noise when they are pleased and wag their tails when they are angry, while a dog wags his to show pleasure, the wisest man cannot

answer your question. A teacher once asked a boy about a cat's whiskers and he said they were to keep her from trying to get her body through a hole that would not admit her head without touching her whiskers.

No one can explain satisfactorily why the sap runs up in a tree and by some chemical process carries from the earth the right elements to make leaves, blossoms or fruit. Nature study is not "why?" It is "how." We all learn in everyday life how a hen will take care of a brood of chicks or how a bee will go from blossom to blossom to sip honey. Would it not also be interesting to see how a little bug the size of a pin head will burrow into the stem of an oak leaf and how the tree will grow a house around him that will be totally unlike the rest of the branches or leaves. That is an "oak gall." If you carefully cut a green one open you will find the bug in the centre or in the case of a dried one that we often find on the ground, we can see the tiny hole where he has crawled out.

Did you ever know that some kinds of ants will wage war on other kinds and make slaves of the prisoners just as our ancestors did in the olden times with human beings? Did you ever see a play-ground where the ants have their recreation just as we have

ball fields and dancing halls? Did you ever hear of a colony of ants keeping a cow? It is a well-known fact that they do, and they will take their cow out to pasture and bring it in and milk it and then lock it up for the night just as you might do if you were a farm boy. The "ants' cow" is a species of insect called "aphis" that secretes from its food a sweet kind of fluid called "honey dew."

The ten thousand things that we can learn in nature could no more be covered in a chapter in this book than the same space could cover a history of the world. I have two large books devoted to the discussion of a single kind of flower, the "orchid." It is estimated that there are about two hundred thousand kinds of flowers, so for this subject alone, we should need a bookshelf over a mile long. This is not stated to discourage any one for of course no one can learn all there is to know about any subject. Most people are content not to learn anything or even see anything that is not a part of their daily life.

The only kind of nature study worth while is systematic. It is not safe to trust too much to the memory. Keep a diary and record in it even the most simple things for future reference. All sorts of items can be written in such a book. As it is

your own personal affair, you need not try to make it a work of literary merit. Have entries such as these:

First frost—Oct. 3rd
First snow—3 inches Thanksgiving day
Skating—December 3rd
Weather clear and bright on Candlemas day, Feb. 2nd and therefore ground-hog saw his shadow
Heard crows cawing—Feb. 18th. Last year—Jan. 26th
Saw first robin—March 14th
Last snow—April 28th

There is scarcely anything in nature that is not interesting and in some way useful. Perhaps you will say "How about a bat?" As a matter of fact a bat is one of our best friends because he will spend the whole night catching mosquitoes. But some one will say "he flies into your hair and is covered with a certain kind of disgusting vermin." Did you ever know of a bat flying into any one's hair? And as for the vermin science tells us that they are really his favourite food so it is unlikely that he would harbour a colony of them very long.

The subject of snakes is one in which there is more misinformation than any other common thing. There are only three venomous kinds of snakes in America. They are the rattlesnake, copperhead and moccasin. All of them can be distinguished by a deep pit behind the eye, which gives them the name of "pit vipers." The general impression that puff adders, pilots, green snakes or water

snakes are poisonous is absolutely wrong, and as for hoop snakes and the snake with a sting in his tail that all boys have heard about, they are absolutely fairy tales like "Jack and the Bean Stalk" or "Alice in Wonderland." We have all heard about black snakes eight or ten feet long that will chase you and wind themselves around your neck, but of the many hundreds of black snakes that a well known naturalist has seen he states that he never saw one that did not do its best to escape if given half a chance. Why so much misinformation about snakes exists is a mystery.

Nature study has recently been introduced into schools and it is a very excellent way to have the interesting things pointed out to us until our eyes are trained to see for ourselves. The usual methods of nature study may be roughly divided into, 1. Keeping pets. 2. Bird study. 3. Insect study. 4. Systematic study of flowers and plants. 5. Wild animal life. The basis of nature study consists in making collections. A collection that we have made for ourselves of moths or flowers, for instance, is far more interesting than a stamp or coin collection where we buy our specimens. If we go afield and collect for ourselves, the cost is practically nothing and we have the benefit of being in the air and sunshine.

One kind of collecting is absolutely wrong — that of birds' eggs, nests or even the birds themselves. Our little feathered songsters are too few now and most states have very severe penalties for killing or molesting them. A nature student must not be a lawbreaker.

The outfit for a butterfly or moth collection is very simple and inexpensive. We shall need an insect net to capture our specimens. This can be made at home from a piece of stiff wire bent into the shape of a flattened circle about a foot across. Fasten the ring securely to a broom handle and make a cheesecloth net the same diameter as the ring and about two feet deep.

The cyanide bottle

It is very cruel to run a pin through insects and to allow them slowly to torture to death. An insect killer that is generally used is called "the cyanide bottle." Its principle ingredient, cyanide of potassium is a harmless looking white powder but it is the *most deadly poison in the world.* Unless a boy or girl knows fully its terrible danger, they should never touch it or even breathe its fumes. One of your parents or the druggist should prepare the

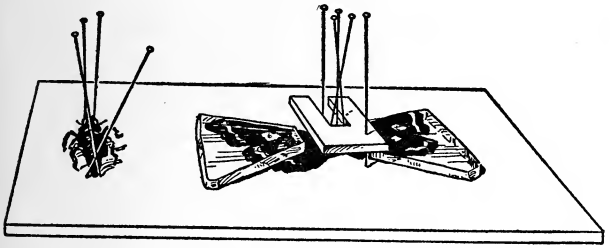
cyanide bottle for you and as long as you do not look into the bottle to watch the struggles of a dying bug or in any way get any of the contents of the bottle on your fingers, you are safe.

Take a wide-mouthed bottle made of clear glass and fit a cork or rubber stopper to it. Then wash the bottle thoroughly and dry it, finally polishing the inside with a piece of soft cloth or tissue paper. Place one ounce of cyanide of potassium into the bottle and pour in enough dry sawdust to cover the lumps of poison. Then wet some plaster of paris until it is the consistency of thick cream and quickly pour it over the sawdust, taking care that it does not run down the sides or splash against the bottle. Place the bottle on a level table and very soon the plaster of paris will set and harden into a solid cake.

Sufficient fumes from the cyanide will come up through the plaster to poison the air in the bottle and to kill any living thing that attempts to breathe it. As you capture your specimens of moths, bugs or butterflies afield you place them into the bottle, and as soon as they are dead, you remove them; fold them carefully in stiff paper and store them in a paper box or a carrying case until you get home. They should then be mounted on boards or cork sheets, labelled carefully with the name of the speci-

men, date and place of capture and any other facts that you may wish to keep.

Considerable skill is required to mount insects properly and in a life-like position. If they are out of shape you must "spread" them before they dry



How insects are spread to dry them in a natural position

out. Spreading consists in holding them in the proper position by means of tiny bits of glass and pins until they are dry.

As moths are, as a rule, night-flying creatures the collector will either obtain them in a larval stage, or will adopt the method of "sugaring," one of the most fascinating branches of nature study. A favourable locality is selected, a comparatively open space in preference to a dense growth, and several trees are baited or sugared to attract the moths when in search of food. The sugar or bait is made as follows: Take four pounds of dark

brown sugar, one quart of molasses, a bottle of stale ale or beer, four ounces of Santa Cruz rum. Mix and heat gradually. After it is cooked for five minutes allow it to cool and place in Mason jars. The bait will be about the the consistency of thick varnish.

Just before twilight the bait should be painted on a dozen or more trees with a strip about three inches wide and three feet long. You will need a bull's-eye lantern or bicycle lamp and after dark, make the rounds of your bait and cautiously flash the light on the baited tree. If you see a moth feeding there, carefully bring the cyanide bottle up and drop him into it. Under no circumstances, clap the bottle over the specimen. If you do the neck of the bottle will become smeared with the bait and the moth would be daubed over and ruined. You will soon have all the specimens that you can care for at one time and will be ready to go home and take care of them.

The moths are among the most beautiful creatures in nature and a reasonably complete collection of the specimens in your neighbourhood will be something to be proud of.

The plant and flower collector should combine his field work with a study of botany. Like most

Photograph by F. W. Stack

The Moth Collector and His Outfit

subjects in school books, botany may seem dry and uninteresting but when we learn it for some definite purpose such as knowing the wild flowers and calling them our friends, we must accept the few strange words and dry things in the school work as a little bitter that goes with a great deal of sweet.

A collection of dried plants is called an herbarium. It is customary to take the entire plant as a specimen including the roots. Separate specimens of buds, leaves, flowers and fruit taken at different seasons of the year will make the collection more complete. Specimens should be first pressed or flattened between sheets of blotting paper and then mounted on sheets of white paper either by glue or by strips of gummed paper.

After a flower is properly identified, these sheets should be carefully numbered and labelled and a record kept in a book so that we can readily find a specimen without unnecessarily handling the specimen sheets. The sheets should be kept in heavy envelopes of manila paper and placed in a box just the size to hold them. The standard or museum size of herbarium sheets is $11\frac{1}{2}$ x $16\frac{1}{2}$ inches. Specimens of seaweed or leaves can be kept in blank books.

A typical label for plants or flowers should be as follows:

Common names	Yellow adder's tongue Dog tooth violet	Date collected, May 16th, 1908
Botanical name	Erythronium Americanum	REMARKS: John Burroughs suggests that the name be changed either to fawn lily because its leaves look like a spotted fawn or trout lily because they always appear at trout fishing season.
Family	Lilies	
Where found	Rockaway Valley near Beaver Brook	

A boy or girl living in a section where minerals are plentiful, can make a very interesting collection of stones and mineral substances, especially crystals. This should be taken up in connection with school work in chemistry and mineralogy. To determine the names of minerals is by no means as easy as that of flowers or animals. We shall need to understand something of blow-pipe analysis. As a rule a high school pupil can receive a great deal of valuable instruction and aid from one of his teachers in this work. Mineral specimens should be mounted on small blocks or spindles using sealing wax to hold them in place.

There are unlimited possibilities in nature for making collections. Shells, mosses, ferns, leaves, grasses, seeds, are all interesting and of value. An

observation beehive with a glass front which may be darkened will show us the wonderful intelligence of these little creatures. The true spirit of nature study is to learn as much as we can of her in all of her branches, not to make a specialty of one thing to the neglect of the rest and above all not to make work of anything.

We see some new side to our most common things when we once learn to look for it. Not one person in ten thousand knows that bean vines and morning glories will twine around a pole to the right while hop vines and honeysuckle will go to the left and yet who is there who has not seen these common vines hundreds of times?

No one can give as an excuse that he is too busy to study nature. The busiest men in national affairs have had time for it and surely we with our little responsibilities and cares can do so too. I once went fishing with a clergyman and I noticed that he stood for a long time looking at a pure white water lily with beautiful fragrance that grew from the blackest and most uninviting looking mud that one could find. The next Sunday he used this as an illustration for his text. How many of us ever saw the possibility of a sermon in this common everyday sight?

IX

WATER LIFE

The water telescope—How to manage an aquarium—Our insect friends and enemies — The observation beehive

THE eggs of so many insects, toads, frogs and other interesting creatures are laid and hatched in water that a close study of pools, brooks and small bodies of water will disclose to the nature student some wonderful stories of animal life. To obtain water specimens for our collection, we shall need a net somewhat similar to the butterfly net described in the previous chapter but with a much stronger frame.

One that I have used for several years was made by the village blacksmith. The ring or hoop is of quarter-inch round iron, securely fastened to a stout handle and bent to a shape as shown in the drawing. To this ring is fastened a regular landing net such as fishermen use, with an extra bag of cheesecloth to fit inside to capture insects too small to be held by the meshes of the outside net. For frogs, turtles, and minnows, the single net is all that is necessary.

This device is almost strong enough to use as a shovel. It will scoop up a netful of mud without bending. This is important as muddy ditches and sluggish ponds will yield us more specimens than swiftly running brooks. In addition to the net, the collector will require a small pail to hold his trophies. A fisherman's minnow bucket is excellent for this purpose and the water can easily be freshened and the contents of the pail reached by simply lifting out the inside pail from the water, which will drain out.

A heavy net is useful to capture aquarium specimens

To study the animal life under the surface of a clear and shallow lake, a water telescope is a great aid. It is simply a wooden box a foot or so long and open at both ends. The inside should be painted black to prevent cross reflection of light. A square of clear glass should be fitted into one end and puttied tight to keep out the water. To use the water telescope,

we simply shove the glass end under water and look into the box. A cloth hood or eye piece to keep out the outside light will make it more effective. The best way to use a water telescope is to lie in the bottom of a boat which is drifting about, and to look through the telescope over the side. As you study the marvellous animal and plant life that passes along under you like a panorama, see to it that in your excitement you do not fall overboard as a boy friend of mine once did.

The care of an aquarium is a never ending source of interest to the nature student. If a boy is handy with tools he can build one himself. It is by no means an easy task however to make a satisfactory water-tight box with glass sides, and my advice is not to attempt it. Glass aquaria may be bought so cheaply that it is doubtful if you can save any money by making one at home. If you care to try it, this is the way it is usually done:

Use a piece of seasoned white wood 1¼ inches thick for the bottom. If you wish your aquarium to be, say, 16 inches wide and 30 inches long, this bottom board should be 20 x 34 to give a margin at the edge. The size of a home-made aquarium can be anything that you desire. It is customary to allow a gallon of water to each three-inch gold fish

that will inhabit it. By multiplying the three dimensions, length, width and height of your box and by dividing your result, which will be in cubic inches, by 231 (the number of cubic inches in a gallon) you can tell how many gallons of water it will hold. Of course the rule for gold fish is not absolute. The nature student will probably have no gold fish at all. They are not nearly so interesting as our native kinds. Besides nearly all varieties of fresh water fish will either kill gold fish or if they are too large to kill will at least make life so miserable for them that to keep them together is cruelty to animals. If we keep in our aquarium the specimens that we collect in our neighbourhood, beetles, newts, crawfish, snails, and tiny sunfish the number may be greatly increased. Overcrowding however is very bad. The ideal we should strive for is not "how many specimens" but "how many kinds" we can have in our collection.

The white wood board should have three or four hardwood cleats screwed to the bottom to prevent warping. The corner pieces of our glass box may either be made of sheet copper or heavy tin, or of wood, if we cannot work in metals. The wooden strips and the bottom board should have grooves ploughed in them to hold the glass. All the wood-

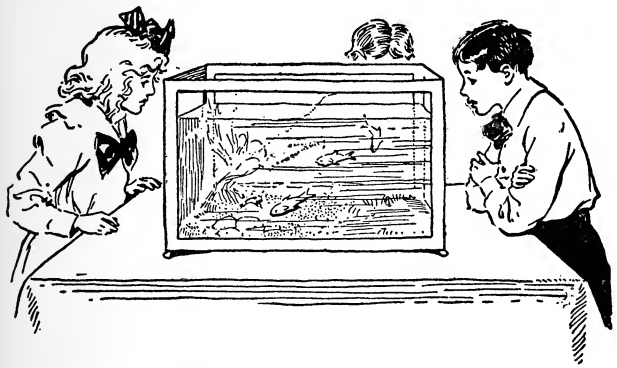
work should be given several coats of asphalt varnish and to further waterproof it and as a final coat use some kind of marine copper paint that is used to coat the bottoms of vessels. Never use the common white lead and linseed oil paint for an aquarium.

You can sometimes buy aquarium cement or prepared putty at a "gold fish" store. This you will need to putty in the glass. If you cannot buy it, make it yourself from the asphalt varnish and whiting. Be sure that the paint and putty of an aquarium is thoroughly dry before you fill it with water.

Perhaps the most satisfactory way to study fish and insect life in water is to use all glass boxes and globes. So many kinds of fish and insects are natural enemies, even though they inhabit the same streams, that they must be kept separate anyway. To put them in the same aquarium would be like caging up two game roosters. If we were studying the development of mosquitoes, for instance, from the larvæ or eggs to the fully developed insect, we should not get very far in our nature study if we put them in an aquarium with fish. A fish will soon make short work of a hundred mosquito wigglers just as a large frog will eat the fish, a snake will eat the frog and so on.

Rectangular glass boxes such as are commonly used for aquaria cost less than a dollar per gallon capacity. Goldfish globes cost about the same. White glass round aquaria are much cheaper and those made of greenish domestic glass are the cheapest of all, a glass tank holding eight gallons costing but two dollars.

Any transparent vessel capable of holding water, even a Mason jar will make an aquarium from which a great deal of pleasure may be derived. The old



A self-sustaining or balanced aquarium

way of maintaining aquaria in good condition required a great deal of care and attention. The water had to be changed at least once a day if running water was not available, and altogether they

were so much trouble that as a rule owners soon tired of them.

Modern aquaria are totally different. By a proper combination of fish and growing plants we can almost duplicate the conditions of nature and strike a balance so that the water need never be changed except when it becomes foul or to clean the glass.

These are called "self-sustaining" aquaria and they are the only kind to have unless we can furnish running water from a public water supply. Self-sustaining aquaria are very simple and any boy or girl living near a brook can stock one at no expense whatever.

The method is as follows: First cover the bottom of the aquarium with a layer of sand and pebbles to a depth of about two inches. Then plant in the bottom some aquatic or water plants that you have collected from a near-by lake. Any kind of water plants will do — the kind of plants boys always call seaweed, even a thousand miles from the sea. In collecting the plants, choose small specimens and obtain roots and all.

If you can find it, the best plant is fanwort. Other good kinds are hornwort, water starwort, tape grass, water poppy, milfoil, willow moss, and floating

plants like duckweed. Even if you do not know these by name they are probably common in your neighbourhood. Fill the tank with clean water. That taken from a spring or well is better than cistern water. After two or three days, when the plants seem to be well rooted, put in your fish. You may keep your aquarium in a light place, but always keep it out of the sun in summer and away from the heat of a stove or radiator in winter.

The nature student will not attempt to stock up his aquarium immediately. He should always leave room for one more fish or bug. One year I started with a lone newt and before the summer was over I had thirteen sunfish, pickerel, bass, minnows, catfish, carp, trout, more newts, pollywogs or tadpoles, five kinds of frogs, an eel and all sorts of bugs, waterbeetles and insects. I soon found that one kind of insect would kill another and that sometimes my specimens would grow wings over night and fly away. But to learn these things, even at our own disappointment is "nature study." If we knew it all in advance, we would not have much use for our experimental aquarium.

Always keep a few snails and tadpoles, for they are the scavengers and will eat the refuse stuff and keep the glass free from greenish scum. Boys

and girls are almost sure to overfeed fish. This is a great mistake, The best standard feed is dried ants' eggs that can be bought for a few cents a box at any bird and fish store. Do not feed pieces of bread and meat. Study what their natural food is and if possible get that for them.

If your fish seem sickly, give them a five-minute bath in salt water every day for a week. The kind of an aquarium above described is intended to fill an entirely different purpose from the usual gold fish globe. In your excursions you will find all sorts of queer looking eggs and specimens. Some of the eggs are so tiny that they look almost like black or white dust on the water. Another kind will be a mass like a jellyfish with brown dots in it, still others will be fastened in masses to the under side of a leaf in the water or perhaps on the bottom. What are they? That is just the question and that is why you will carefully collect them and take them home to await developments.

Always keep an accurate note-book with dates and facts. Also keep a close watch on your specimens. Sometimes they will hatch and be eaten by the other bugs before you could read this chapter.

A nature student will need some part of the house that he may call his very own. Here he can keep

his specimens, his aquarium, his herbarium and what not. Around the wall he can hang the twigs with their cocoons, oak galls, last year's wasp and bird nests and other treasures. He should also have a work table that a little glue or ink will not injure and a carpet that has no further use in the household. Usually one corner of the attic or cellar is just the place.

See to it that you do not make other people uncomfortable in the pursuit of your hobby. You will find that almost every one is afraid of bugs and toads and that most people live in a world full of wonderful things and only see a little beyond the end of their noses.

There is a very practical side to nature study and the principal way that we can make it really pay, is to know our friends from our enemies in the animal and insect world. There are insects that chew, suck and bore to ruin our orchards and grain crops. They are our enemies. If we know their life story, where they hide and how they breed, we can fight them better. For every dollar's worth of crops that a farmer grows, it is estimated that his insect enemies eat another dollar's worth. A little bug called the "San José" scale has nearly ruined the orchards of some of the Eastern states. To

fight him, we must know how he lives. That is nature study. By study we learn that the hop-toad is our best garden friend. He will spend the whole night watching for the cutworms that are after our tomato plants. When we see a woodpecker industriously pecking at the bark of our apple trees, we know that he is after the larvæ of the terrible codling moth and we call him our friend.

After we learn that a ladybug lives almost entirely on plant lice and scale insects, we never kill one again except perhaps to place a specimen in our collection. Naturalists say that without ladybugs, our orchards would soon be entirely killed off.

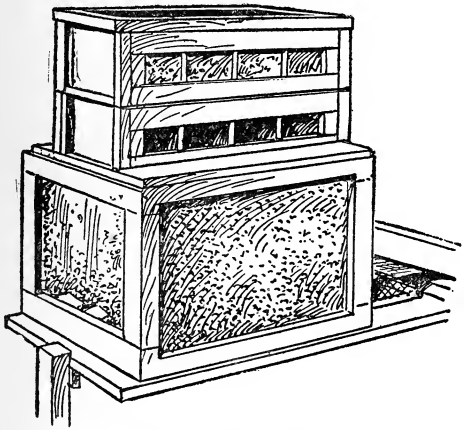
The dragon fly or mosquito hawk as well as "water tigers," water striders and many kinds of beetles are the natural enemies of mosquitoes and as they never harm our crops we should never harm them. Nearly every living creature has some enemies.

You have perhaps heard the famous verse of Dean Swift:

> "So naturalists observe, a flea
> Has smaller that upon them prey
> And these have smaller still to bite 'em
> And so proceed *ad infinitum*."

Among our insect friends the leading place belongs either to the honey bee or the silkworm. As silkworms are not especially successful in this

country and as their principal food, mulberry trees, are not common, the nature student who cares to study our beneficial insects had better devote his



An observation beehive

attention to honey bees. An observation beehive is simply a glass box or hive instead of a wooden one. When we are not engaged in studying our bee city, the hive must be covered with a blanket as bees prefer to work in the dark. A boy or girl living in the country can also keep bees profitably and thus combine business with pleasure. A single hive will in a few years produce enough swarms to give us a good start as "bee farmers."

X

THE CARE OF PETS

Cats — Boxes for song birds — How to attract the birds — Tame crows — The pigeon fancier — Ornamental land and water fowl — Rabbits, guinea pigs, rats and mice — How to build coops — General rules for pets — The dog

IN THIS chapter on pets, I regret exceedingly that I cannot say much in favour of the family cat. Like nearly all children, I was brought up to love kittens and to admire their playful, cunning ways. When a kitten becomes a cat my love for it ceases. Cats will do so many mean, dishonourable things, and will catch so many song birds and so few rats and mice that it simply has become a question whether we shall like the song birds or the cat. So many people do like cats that it is unfair perhaps to condemn the whole race for the misdeeds of a few. If a cat is carefully watched or if we put a bell on its neck, these precautions will to a certain extent keep the cat from catching birds, but most people have something better to do than to act as guardian for a cat. The

fact is that a cat is a stupid animal seldom showing any real affection or loyalty for its owner and possessing but little intelligence. It is very difficult to teach a cat even the simplest tricks. We never know when a cat will turn on its best friend. They have the "tiger" instinct of treachery. A cat which one minute is contentedly purring on our lap may sink its claws into us the next.

The only way to force a cat to catch mice is to keep it half starved. Then instead of catching mice, it will probably go after birds if there are any in the neighbourhood. I have shut a cat up in a room with a mouse and it is doubtful whether the cat or the mouse were the more frightened. The cat does more damage to the song birds of this country than any other enemy they have. If kept at home and well fed, cats sometimes become so fat and stupid that they will not molest birds but this is due to laziness and not to any good qualities in the cat. In normal condition they are natural hunters.

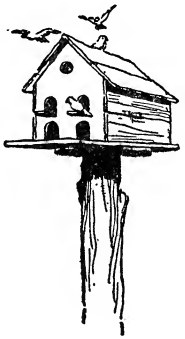
The habits of a cat are unclean, its unearthly cries at night are extremely disagreeable and altogether it is a nuisance. A famous naturalist, Shaler, once said "A cat is the only animal that has been tolerated, esteemed and at times worshipped without having a single distinctly valuable quality."

A few years ago a quail had a nest under a rock opposite my house. Quail raise their young like poultry rather than like robins or wrens or the other song birds. As soon as the tiny quail chicks are hatched, the mother takes them around like a hen with a brood of chickens. This mother quail was my especial care and study. She became so tame that I could feed her. Finally she hatched out ten tiny brown balls of feathers. Our cat had been watching her, too, but not from the same motives and one day the cat came home with the mother quail in her mouth. She ran under the porch just out of reach and calmly ate it. The little brood were too small to look out for themselves so of course they all died or fell an easy victim to other cats. The mother was probably an easy prey because in guarding the young, a quail will pretend to have a broken wing and struggle along to attract attention to her and away from her little ones, who scurry to high grass for safety. I have never been very friendly to cats since I witnessed this episode.

It has been estimated that the average domestic cat kills an average of one song bird a day during the season when the birds are with us. In certain sections a cat has been known to destroy six nests of orioles, thrushes and bobolinks in a single day.

The worst offenders are cats that live around barns and old houses in a half wild condition. Many people who say they "haven't the heart to kill a cat" will take it away from home and drop it along the road. A thoughtless act like this may mean the death of a hundred birds in that neighbourhood. It takes less heart to kill the cat than to kill the birds. So much for the cat.

Birds make splendid pets, but in keeping them in captivity, we must be sure that we are not violating the game laws of the state we live in. Nearly everywhere it is unlawful to keep in cages any native song birds or those that destroy harmful insects — the so-called "insectivorous birds." This includes thrushes, wrens, robins, bluebirds, orioles or, in fact, practically all birds but crows, blackbirds and kingfishers. It does not cover canaries, parrots, or any birds that are not native. It is an excellent law and every boy or girl should act as a special policeman to see that his friends and companions do not molest either birds or their nests. It is cruel to cage



A bird house

a wild bird anyway for a cage is nothing but a prison. There is no law against taming the birds or making friends of them and after all this is the most satisfactory way.

If we build houses for the birds to nest in, provide feed for them and in other ways do what we can to attract them, they will soon learn that we are their friends. We must study their habits and always avoid frightening them. Next to a cat, the worst enemies of our song birds are the English sparrows. A sparrow is always fair game for the boy with a slingshot or rifle. In many places these sparrows have driven practically all the other birds out of the neighbourhood, have robbed their nests and in other ways have shown themselves to be a public nuisance. Until 1869 there were no sparrows in this country and now they are more numerous than any other variety of birds, and sooner or later, the Government will have to take steps to exterminate them or we shall have no song birds at all.

The usual size of a bird house is six inches square and about eight inches high. It should always be made of old weather-beaten boards in order not to frighten away its prospective tenants by looking like a trap of some kind. The chances are that the

sparrows will be the first birds to claim a house unless we keep a close watch and drive them away.

One way to keep them out is to make the entrance doorway too small for them to enter. A hole an inch in diameter will admit a wren or chickadee and bar out a sparrow, but it will also keep out most of the other birds. The usual doorway should be two inches in diameter. It is surprising how soon after we build our bird house we find a tiny pair making their plans to occupy it and to take up housekeeping. Sometimes this will happen the same day the bird house is set up. Always provide some nesting material near at hand; linen or cotton thread, ravellings, tow, hair and excelsior are all good. Of course we must not attempt to build the nest. No one is skillful enough for that.

Nearly all of our native birds are migratory, that is they go south for the winter. The date that we may look for them to return is almost the same year after year. Some few birds—bluebirds, robins, cedar birds and song sparrows will stay all winter if it is mild but as a rule we must not expect the arrival of the feathered songsters until March. The phœbe bird is about the first one we shall see.

In April look for the brown thrasher, catbird,

wren, barn, eave and tree swallows, martins, king birds and chipping sparrows. In May the principal birds of our neighbourhood will return — thrushes, vireos, tanagers, grosbeaks, bobolinks, orioles. The game birds — quail, partridge, meadowlarks and pheasants do not migrate as a rule. At least they do not disappear for a time and then return. When they leave a neighbourhood, they rarely come back to it.

All the song birds begin nesting in May. Consequently we should have our bird houses "ready for occupancy" May 1st. It will take about twelve days for most birds to hatch their eggs. Some varieties will hatch three broods in a season, but two is the usual rule.

We shall require a great deal of patience to tame the wild birds. Some bird lovers have succeeded in teaching birds to feed from their hands. A wild bird that is once thoroughly frightened can probably never be tamed again.

A crow is a very interesting pet. Crows are especially tamable and may be allowed full liberty around the dooryard. We must get a young one from the nest just before it is ready to fly. Crows are great thieves and are attracted by bright objects. If you have a tame crow, and if any member of

your household misses jewellery or thimbles you had better look in the crows' nest before you think that burglars have been around.

The chief difference between tamed wild animals, such as squirrels, birds, owls, foxes, crows and so on, and the domesticated animals and birds, dogs, cats, rabbits, guinea pigs, pigeons and chickens, lies in the possibility with the latter of modifying nature and breeding for certain special markings, colours or size. All breeds of chickens from the little bantams to the enormous Brahmas have been bred from a wild species of chicken found in India and called the jungle fowl.

All the great poultry shows held throughout the country annually are for the purpose of exhibiting the most perfectly marked specimens of the breeders' skill. This is decided by judges who award prizes. The competition is sometimes very keen. In barred Plymouth Rock chickens, for example, there are sometimes a hundred birds entered to compete for a single prize. The breeders are called fanciers. The principal breeders of certain animals such as rabbits, pigeons or poultry, form an association or club and agree to an imaginary type of the animal called the ideal or "Standard of Perfection."

For example, the breeders of white fantail pigeons

agree that perfect birds shall be of certain shape and size, with the head resting on the back just at the base of the tail; the tail should be spread out like a fan and contain at least twenty-eight feathers. These feathers should be laced on the ends. The model fantail should have a nervous jerky motion and never be at rest. Each of these points is given a certain value on a scale of marking and in judging the birds they are marked just as you may be in your lessons at school. The fancier tries to breed a bird that comes the nearest to this model. The prizes are sometimes of great value.

There is an enormous list of breeds in nearly all varieties of animals and poultry. In pigeons alone there are carriers, pouters, tumblers, baldheads, beards, dragoons, barbs, jacobins, Antwerps, turbits, owls, orientals, damoscenes, capuchins, fantails, trumpeters, swifts, Lahores, Burmese, Scandaroons, magpies, nuns, Archangels, runts and so on.

These birds are very different in appearance, the pouter, for example, has the power of inflating his crop until it puffs out in front as large as a baseball. Jacobins or as they are commonly called, "ruffle-necks," have an immense ruffle of feathers like a feather boa. Dragoons have a huge wart on the bill as large as an almond. The tumblers are so named

from their habit of turning backward somersaults during flight.

Almost every one who starts keeping domestic pets either soon tires of the sport or becomes a fancier. The care of common pigeons is a very simple matter. The principal thing is a good loft or cote for them in the top of a barn or house. They will practically take care of themselves and after a few years greatly increase in numbers.

A model pigeon house for breeding fancy pigeons requires separate mating boxes, nests and other appliances. It would be impossible to make much of a success with fancy pigeons if they are allowed their liberty to fly about and mate at will.

The best nest boxes for pigeons are rough earthenware pans, eight inches across, which may be bought cheaply at a bird store. The floor of the cote should be covered with sawdust or gravel to the depth of half an inch. Pigeons that are confined should be fed regularly on a mixture of small grains and cracked corn. They should also be given cracked oyster shells, grit and charcoal occasionally. A pigeon loft should be rat proof and clean.

It is very doubtful whether there is any money in raising pigeons or squabs for market. Fanciers never sell their output for market purposes unless

it is to get rid of surplus or undesirable stock. A breeder who is successful in winning prizes with birds of his "strain" as it is called will find a ready market with other breeders for all the birds he cares to sell. Prize winning birds sometimes bring a hundred dollars a pair. It is by no means easy to breed prize-winners and the chances are that the beginner will be a buyer of stock rather than a seller.

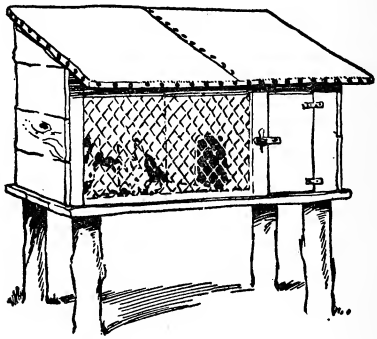
Homing pigeons or as they are commonly called, carriers, are not bred for special markings like fancy pigeons but because of their power and speed in flight. A carrier has the "homing" instinct more fully developed than any other animal. In some homing pigeon races, the birds have made speed records of over a mile a minute for many hours and have flown over a thousand miles. If a well-bred homing pigeon fails to return to his home loft it is almost a certainty that he is either forcibly detained or that he has been killed by hunters or hawks. Never try to capture a pigeon that may stop for a rest at your loft. He may be in a race and his owner may be waiting for his return five hundred miles away when every minute counts in winning a prize.

Another large class of birds that make fine pets although they are not strictly in the class of birds

bred by the fancier are the ornamental land and water fowl. The chief objection to these birds as pets is the expense of buying them. The list of birds in this class is very large. In swans the leading varieties are mute, American whistling, black Australian, white Berwick and black-necked swans. The largest class are the pheasants. They are exceedingly beautiful, especially the golden, silver, Lady Amherst, Elliott, Reeves, green Japanese, Swinhoe, English ring neck, Melanotis, and Torquatis pheasants. The common wild geese are Egyptian, Canadian, white-fronted, Sebastopol, snow, brant, bar-headed, spin-winged and many others. In ducks, there are mallards, black, wood, mandarin, blue and green winged teal, widgeon, redhead, pin-tail, bluebill, gadwell, call and many others. Beside pheasants, ducks and geese there are also the various storks, cranes, pea-fowl and herons in the "ornamental fowl" list.

These are all wild fowl. The commoner varieties will cost from six to fifteen dollars a pair and the rare ones several hundred. To keep the semi-wild birds from flying away they are usually pinioned, a process of taking off the end joint of one wing. The colours of some of the ornamental fowl are more beautiful than any birds in nature. Pheasants

especially are easily cared for and make interesting pets. They can be tamed and if kept outdoors they will seldom be subject to disease. Most of these birds are as easily cared for as chickens.



A home-made rabbit house

Rabbits make fine pets for boys and girls. They are clean in their habits, hardy and gentle. The common kinds are white rabbits with pink eyes or albinos, and brown rabbits or Belgian hares. With rabbits also there is a "fancy." The Fur Fanciers' Association recognizes the following distinct breeds: Belgians, Flemish giants, Dutch marked, English, Himalayan, silvers, tans, Polish, lops, and Angoras.

A rabbit hutch or coop is easily built from old packing boxes. One third of the coop should be

darkened and made into a nest, with an entrance door outside and the rest simply covered with a wire front, also with a door for cleaning and feeding. The hutch should stand on legs above ground as rabbits do not thrive well in dampness. They will, however, live out all winter in a dry place. A box four feet long and two feet wide will hold a pair of rabbits nicely. Rabbits will become very tame and may often be allowed full liberty about the place if there are no dogs to molest them.

The drawing shows a standard type of rabbit hutch. A boy who is handy with tools can easily build one. We can always dispose of the increase in our rabbit family to friends or to dealers.

Guinea pigs or cavies are similar to rabbits in their requirements. The chief difference is that guinea pigs cannot stand excessive cold and will not do well if kept outside in severe winter weather. Rabbits and cavies will eat almost anything and eat constantly. The usual feed is hay, clover, wheat, corn, carrots, turnips, cabbage, lettuce, celery, potato parings, or any green food or grains. Cavies are especially fond of bread and milk.

The three classes of cavies are Peruvians or Angoras, with long silky hair; Abyssinians, with coarse hair in tufts or rosettes, and the common guinea

pig or smooth cavy. A pair of cavies will cost about two dollars. A dry airy cellar is a good place to keep them as they are cleanly in their habits. Neither cavies nor rabbits are especially intelligent but they do learn to know their master or at least the one who feeds them. Pet rats and mice are in the same class as rabbits but they should always have a coop that they will not gnaw out of. There is even a mouse club. It is in Europe and has over a thousand members.

An interesting example of skill in breeding is seen in Dutch belted varieties of cattle, in hogs, rabbits, cavies and mice. In all of these animals the same markings have been bred by careful crossing and selection. In all lines of "fancy" it is important to stick to a few varieties. We shall never make much of a success if we have half a dozen kinds of chickens, pigeons or rabbits. By far the most important "fancy" is with chickens, but this subject will be considered in the chapter on the care of poultry.

Among other pets are tame squirrels, turtles, snakes, lizards and toads. A tame gray squirrel makes a splendid pet. After a while we can give our squirrel full liberty and find him back in his nest at night. I once had a tame owl but I found that because of his habit of flying and feeding at night

he was a very stupid pet. Besides that his powerful beak and sharp claws or talons were dangerous. I also once had a pair of flying squirrels but they also only appear at night and were consequently uninteresting in the daytime. We must always study the natural habits of our pets and try to give them coops and food as much like nature as possible. My flying squirrels were given soft feed in place of the usual hard-shelled nuts. Consequently their teeth grew so long that they were a positive deformity. We finally liberated them but before they could get to a place of safety one of them was caught and killed by a chicken. The poor little creature was so fat from overfeeding and lack of exercise that he had all but lost the power of using his legs.

Coops for pets may be as elaborate as our pocketbook will allow. The important things to remember are to construct a coop so that it may be cleaned easily, and to provide plenty of ventilation. It must also be dry. Fresh air is as important for animals as for people. The larger we can make a coop, the better it will be. Be careful not to overfeed pets. Regular and frequent meals of just what they will eat up clean is better than an occasional big meal. Rabbits require very little water. Usually they will obtain enough moisture from the green

food they eat. It is a mistake, however, to think that water will kill rabbits. Change the straw in the nest boxes frequently. When they make fur nests do not disturb them.

For squirrels and other small animals, the coop may be made entirely of wire except the baseboard, which should be a piece of seasoned wood. Be sure that there are no sharp wire points or projecting nails in a coop to injure the animals.

The whole secret of taming wild creatures is patience. We must try to show them that we are their friends. The most direct way to an animal's heart is through his stomach, which is another way of saying that the owner should personally feed his own pets if he wishes them to know him.

There is really no reason why a country boy or girl should have any caged pets at all. In the city it is different. Perhaps the best pet for the unnatural conditions of city life is a canary. The real spirit to develop a love for the little creatures that inhabit our woods and fields is to feel that they are our friends rather than that they are prisoners. By all means cultivate the acquaintance of your "small country neighbours."

THE DOG

Every boy should own a dog. He is the friend and companion of our youth. For a boy to grow

up without a dog is to be denied one of the real joys of life.

Senator Vest once said: "The one absolute, unselfish friend that a man can have in this selfish world; the one that never deserts him, the one that never proves ungrateful or treacherous is his dog. He will sleep on the cold ground where the wintry winds blow and the snow drives fiercely if only he can be near his master's side. He will kiss the hand that has no food to offer, he will guard the sleep of his pauper master as if he were a prince. When all other friends desert he remains."

The breed makes but little difference so long as the dog is intelligent and kind. Mixed breeds and mongrel dogs are often the most intelligent. A thoroughbred dog will give us more satisfaction possibly than a mongrel because he will make a better appearance. But at the same time, he is far more likely to be stolen. There are so many breeds to select from that it is almost impossible to give much advice. As a rule, the dog we shall like is the one we can get. The very heavy dogs such as Saint Bernards, mastiffs and great Danes are clumsy and will require outside quarters, as they are too bulky to have in the house. On the other hand the small toy breeds such as Pomeranians, black

and tans and King Charles spaniels and pugs, are too delicate to be a real boy's dog. A list from which you may safely select a dog would be bull terriers, Airedale terriers, Scotch terriers, Irish terriers, cocker spaniels, pointers and setters, either Irish or English. This is by no means a complete list. I prefer a setter because my first dog, "Old Ben," was a setter, and he shared in most of my fun from the earliest recollections that I have. When he died I lost a true friend. It was the first real sorrow I ever had.

A dog should not sleep in the same room with his owner, but should have a warm dry kennel and be taught to regard it as his home.

Do not make the mistake of overfeeding a dog. He does not need three meals a day. One is sufficient, about nine in the morning, when he should have all he wants to eat. If you insist on a second meal give him a dog biscuit or a bone to gnaw on in the evening.

Keep your dog free from fleas, in spite of what David Harum says that "a reasonable amount of fleas is good for a dog, because it keeps him from brooding over being a dog." A thorough bath with carbolic soap and water will rid a dog of fleas, but this treatment should be repeated at weekly intervals to kill the eggs which hatch in the meantime.

Fresh insect powder or Scotch snuff if dusted thoroughly in a dog's coat will cause fleas to leave. This treatment should be done out of doors. A good plan is to place the dog on a sheet or piece of white paper and work the powder well into the hair, especially around his neck and behind the ears. Be careful not to injure his eyes.

A dog will soon recognize his master, and there is no quicker way to show that you are his master than to enforce obedience when you attempt to make him mind. Whether a whipping is necessary depends on the dog. With most dogs a good scolding will be sufficient. Never whip a dog when you are angry and never overdo the matter. It is possible to "break a dog's spirit," which simply means to make him afraid of you. A dog so frightened is ruined until you regain his confidence, a very difficult thing to do. Never cuff a dog with your hand. Always use a whip or switch. Let the whipping be a definite ceremony with a plain object in view.

Some dogs will prove to be headstrong and others will try to do whatever their master wants. There is an amazing difference in dogs and their intelligence seems to have no limits.

A dog must never be allowed to annoy our neighbours or friends. One of the most annoying habits

that a dog cultivates is that of running out and barking at passing carriages or people. A few lessons in discipline early in life will break him of this habit, but once acquired it is practically unbreakable.

Another very annoying habit is that of allowing a dog to put his paws on us. We may not mind it when we are dressed in old clothes but friends or callers are possibly not so considerate.

Nearly every bad habit that a dog learns is usually the fault of the owner rather than of the dog. The training of a dog should be done as a puppy. Therefore we must secure our dog as young as possible.

In training hunting dogs the first step is called "yard-breaking." With ordinary dogs a thorough course in yard-breaking by teaching the simple command is all that will be necessary. First of all, teach your dog to lie down and come to you at call. The usual word for the former is "charge." A dog can be taught this in a very short time. Take him by the neck and back, and at the word, force him to lie down. Do not use any other words, or even pet him. Simply impress on his mind that when he hears "charge" it means lie down. As a rule a puppy is taught to come by snapping the fingers

or by making a noise with the lips similar to that by which we urge a horse. It is almost natural to say "Come here." After a puppy learns to follow us at the command "heel in" and to run ahead when we say "go on," we must also teach him to come when we whistle. Most boys can make a whistle with the fingers sufficiently penetrating to call a dog for a long distance but a small metal whistle to carry in the pocket is the best way.

After a dog has acquired the simple lessons of training we shall find that he learns to understand us and to do our wishes very quickly. There should be a complete understanding between a dog and his owner. He will know our ways and we shall know his.

I have hunted in Virginia with a dog so intelligent that merely by watching him his master could tell whether he was on the trail of a rabbit, wild turkey, or deer. For each kind of game he had a different manner of barking and what is more remarkable, he was a thoroughly broken quail dog with the best "nose" or scent I have ever known and of course did not bark under these circumstances. Such a dog would be a mystery to any one who did not know his ways.

This dog "Old Doc" would hunt with any one on

quail, but if the hunter did not succeed in killing game the dog would soon show his disapproval in every way, sulk along behind, and if the poor shooting continued, finally leave for home. A friend who took him out told me, "First I missed the birds and then I missed the dog." He had left in disgust.

No matter what breed our dog is we shall surely become greatly attached to him and almost look upon him as a friend rather than as an animal. A boy should never encourage a dog to fight. It is a cruel, unmanly thing and one that a real dog lover will never do. Dog fighting is a form of brutality second only to tying tin cans and other things to a dog's tail for the "fun" of seeing him run. I once saw a poor beast lose his tail as a result of this brutal joke. Some one had tied a string tightly around his tail and the dog ran until completely exhausted. He then kept out of sight for a few days. In the meantime the string caused his tail to become fearfully sore and finally to fall off. Can any one see a joke in this?

XI

THE CARE OF CHICKENS

The best breed — Good and bad points of incubators — What to feed small chicks — A model chicken house

A PEN of chickens gives a boy or girl an opportunity for keeping pets that have some real value. Whether there is much profit in poultry is a question, but it is at least certain that the more care you give them the better they pay. There is but little difference in the results obtained from the various breeds of chickens, but there is a great difference in the people who take care of them. It is very difficult to make poultry pay on a large scale. Nearly every poultry farm that has started as a business has failed to make a success. The surest way to make chickens pay is to have only a few. Then the table scraps and the worms and weed seeds they can pick up will supply them with practically all their feed and the time you give them need not be counted as expense.

There are sixty or seventy distinct breeds of poultry recognized by expert fanciers and from three

to ten colours or varieties in many of these breeds. New ones are being added constantly. For example, a breed called Orpingtons was recently introduced from England and now has ten varieties or colours that are "standard." At the New York Poultry Show a record price of $2,500 was paid for the prize-winning hen of this breed. There is a style in chickens as well as in anything else. A new breed will always have a great many admirers at first, and great claims will be made for its superior qualities. The poultrymen who have stock and eggs to sell will secure high prices for their output. Very soon, however, the real value of a new breed will be known and it will be on the same basis as the older breeds.

A beginner had better start with some standard recognized breed and leave the experimenting to some one else. One thing is certain: thoroughbreds will pay better than mongrels. Their eggs are of more uniform size and colour, the stock will be healthy and as a rule weigh a pound or two more than birds of uncertain breeding. Thoroughbreds do not cost any more to feed or care for than the mongrels and in every way are superior.

Breeds of poultry are usually divided into three separate classes, depending on the place where the

breed originated. They are the American, Asiatic, and Mediterranean strains. The leading American breed is the barred Plymouth Rock and for a beginner will probably be the best to start with.

Another very excellent American or general purpose breed is the White Wyandotte. They are especially valuable as broilers, as they make rapid growth while young. The Leghorns are the leading breed for eggs. They are "non-sitters" and, being very active, do not become overfat. Their small size, however, makes them poor table fowls and for this reason they are not adapted to general use. The Asiatic type, which includes Brahmas, Langshans, and Cochins, are all clumsy, heavy birds, which make excellent table fowl but are poor layers and poor foragers. Brahma roosters will frequently weigh fifteen pounds and can eat corn from the top of a barrel.

A beginner should never attempt to keep more than one kind of chickens. To get a start, we must either buy a pen of birds or buy the eggs and raise our own stock. The latter method will take a year more than the former, as the chicks we hatch this year will be our layers a year later. Sometimes a pen of eight or ten fowls can be bought reasonably from some one who is selling out. If we buy from a breeder who is in the business they will cost about

five dollars a trio of two hens and a rooster. The cheapest way is to buy eggs and hatch your own stock. The usual price for hatching-eggs is one dollar for fifteen eggs. We can safely count on hatching eight chicks from a setting, of which four may be pullets. Therefore we must allow fifteen eggs for each four pullets we intend to keep the next year. The surplus cockerels can be sold for enough to pay for the cost of the eggs. If we have good luck we may hatch every egg in a setting and ten of them may be pullets. On the other hand, we may have only two or three chicks, which may all prove to be cockerels; so the above calculation is a fair average. If we start with eggs, we shall have to buy or rent some broody hens to put on the eggs. A good plan is to arrange with some farmer in the neighbourhood to take charge of the eggs and to set his own hens on them. I once made such an arrangement and agreed to give him all but one of the cockerels that hatched. I was to take all the pullets. The arrangement was mutually satisfactory and he kept and fed the chicks until they were able to leave the mother hen — about eight weeks. It is also possible to buy one-day-old chicks for about ten or fifteen cents apiece from a poultry dealer, but the safest way is to hatch your own stock.

The easiest way to make a large hatch all at one time is with an incubator. There are a number of very excellent makes advertised in the farm papers and other magazines and the prices are quite reasonable. An incubator holding about a hundred eggs will cost ten or twelve dollars. There are many objections to incubators which we can learn only from practical experience. We shall not average more than 50 per cent. hatches as a rule. That is to say, for every hundred eggs we set we must not count on hatching more than fifty chicks. Incubators are a constant care. The most important objection to an incubator is that it is against the rules of most fire insurance companies to allow it to be operated in any building that the insurance policy covers. If the automatic heat regulator fails to work and the heat in our incubator runs up too high we may have a fire. At any rate, we shall lose our entire hatch. The latter is also true if the lamp goes out and the eggs become too cool. I have made a great many hatches with incubators of different makes and my experience has been that we must watch an incubator almost constantly to have success with it.

The sure way to hatch chickens is with a broody hen, but at the same time incubators are perfectly

satisfactory if run in a room where the temperature does not vary much (a cellar is the best place). With an incubator there is always a temptation to attempt to raise more chickens than we can care for properly. Overcrowding causes more trouble than any other one thing. It is better to have a dozen chickens well cared for than a hundred that are neglected.

Eggs for incubators will cost about five dollars a hundred. Of course if they are from prize-winning stock the cost will be several times this amount. Before placing any eggs in an incubator it should be run for two days to be sure that the heat regulator is in working order. The usual temperature for hatching is 103 degrees and the machine should be regulated for this temperature as it comes from the factory. Full directions for operating, as well as a thermometer, will come with the machine and should be studied and understood before we begin to operate it. As the hatch progresses, the heat will "run up," as it is called, and we shall need to understand how to regulate the thermostat to correct this tendency toward an increased temperature. The eggs in an incubator must be turned twice a day. To be sure that we do this thoroughly it is customary to mark the eggs before we place

them in the machine. The usual mark is an "X" on one side of the egg and an "O" on the other written in lead pencil. In placing the eggs in the trays we start with all the "O" marks up, for instance, and at the time of the first turning leave all the "X's" visible, alternating this twice every day.

In order to operate an incubator successfully, we shall also need a brooder, which is really an artificial mother. There is a standard make of brooder costing five dollars that will accommodate fifty chicks. Brooders are very simple in construction and can be made at home. A tinsmith will have to make the heating drum. The rest of it is simply a wooden box with a curtain partition to separate the hot room from the feeding space. Ventilating holes must be provided for a supply of fresh air and a box placed at the bottom to prevent a draught from blowing out the lamp. In a very few days after we place the chicks in a brooder they should be allowed to go in and out at will. In a week or two we shall be able to teach them the way in, and then by lowering the platform to the ground for a runway we can permit them to run on the ground in an enclosed runway. On rainy days we must shut them in.

There is always a temptation to feed chicks too

soon after they are hatched. We should always wait at least twenty-four hours to give them a chance to become thoroughly dry. The general custom of giving wet cornmeal for the first feed is wrong. Always feed chicks on dry food and you will avoid a great deal of sickness. An excellent first food is hard-boiled egg and corn bread made from cornmeal and water without salt and thoroughly baked until it may be crumbled. Only feed a little at a time, but feed often. Five times a day is none too much for two-week-old chicks.

One successful poultryman I am acquainted with gives, as the first feed, dog biscuit crushed. All the small grains are good if they are cracked so that the chicks can eat them. The standard mixture sold by poultrymen under the name "chick food" is probably the best. It consists of cracked wheat, rye, and corn, millet seed, pinhead oatmeal, grit, and oyster shells. Do not feed meat to chicks until their pin feathers begin to show, when they may have some well-cooked lean meat, three times a week.

There is quite an art in setting a hen properly. They always prefer a dry, dark place. If we are sure that there are no rats around, there is no better place to set a hen than on the ground. This is as they sit in nature and it usually seems to be the case

that a hen that steals her nest will bring out more chicks than one that we have coddled. Eggs that we are saving for hatching should be kept in a cool place but never allowed to freeze. They should be turned every day until they are set. Hens' eggs will hatch in about twenty-one days. The eggs that have failed to hatch at this time may be discarded. When we move a broody hen we must be sure that she will stay on her new nest before we give her any eggs. Test her with a china egg or a doorknob. If she stays on for two nights we may safely give her the setting. It is always better when convenient to set a hen where she first makes her nest. If she must be moved, do it at night with as little disturbance as possible. It is always a good plan to shut in a sitting hen and let her out once a day for feed and exercise. Do not worry if in your judgment she remains off the nest too long. The eggs require cooling to develop the air chamber properly, and as a rule the hen knows best.

Young chickens are subject to a great many diseases, but if they are kept dry and warm, and if they have dry food, most of the troubles may be avoided. With all poultry, lice are a great pest. Old fowls can dust themselves and in a measure keep the pest in check, but little chicks are comparatively

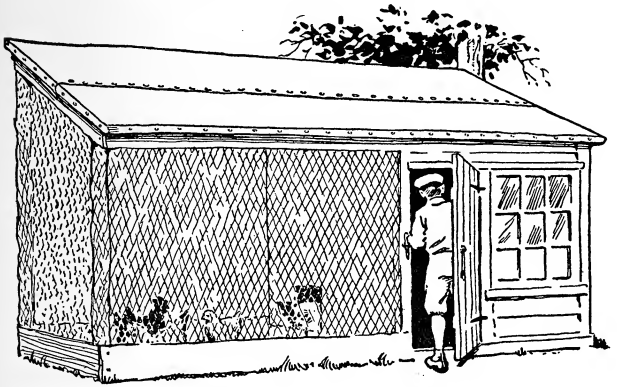
helpless. The big gray lice will be found on a chick's neck near the head. The remedy for this is to grease the feathers with vaseline on the head and neck. The small white lice can be controlled by dusting the chicks with insect powder and by keeping the brooder absolutely clean. A weekly coat of whitewash to which some carbolic acid has been added will keep lice in check in poultry houses and is an excellent plan. Hen-hatched chicks are usually more subject to lice than those hatched in incubators and raised in brooders, as they become infected from the mother. Some people say that chicks have lice on them when they are hatched, but this is not so.

The first two weeks of a chick's life are the important time. If they are chilled or neglected they never get over it, but will develop into weaklings. There are many rules and remedies for doctoring sick chickens, but the best way is to kill them. This is especially so in cases of roup or colds. The former is a very contagious disease and unless checked may kill an entire pen of chickens. A man who raises 25,000 chickens annually once told me that "the best medicine for a sick chicken is the axe."

A very low fence will hold small chicks from straying away, but it must be absolutely tight at

the bottom, as a very small opening will allow them to get through. Avoid all corners or places where they can be caught fast. The mesh of a wire fence must be fine. Ordinary chicken wire will not do.

A brooder that will accommodate fifty chicks comfortably for eight weeks will be entirely too



A home-made chicken coop built on the "scratching-shed" plan

small even for half that number after they begin to grow. As soon as they can get along without artificial heat, the chickens should be moved to a colony house and given free range. They will soon learn to roost and to find their way in and out of their new home, especially if we move away the old one where they cannot find it.

A chicken coop for grown fowls can be of almost any shape, size, or material, providing that we do not crowd it to more than its proper capacity. The important thing is to have a coop that is dry, easily cleaned and with good ventilation, but without cracks to admit draughts. A roost made of two by four timbers set on edge with the sharp corners rounded off is better than a round perch. No matter how many roosts we provide, our chickens will always fight and quarrel to occupy the top one. Under the roost build a movable board or shelf which may easily be taken out and cleaned. Place the nest boxes under this board, close to the ground. One nest for four hens is a fair allowance. Hens prefer to nest in a dark place if possible. A modern, up-to-date coop should have a warm, windproof sleeping room and an outside scratching shed. A sleeping room should be provided with a window on the south side and reaching nearly to the floor. A hotbed sash is excellent for this purpose. The runway or yard should be as large as our purse will permit. In this yard plant a plum tree for shade. The chickens will keep the plum trees free from the "curculio," a small beetle which is the principal insect pest of this fruit. This beetle is sometimes called "the little Turk" because he

makes a mark on a plum that resembles the "star and crescent" of the Turkish flag.

Whether we can make our poultry pay for the trouble and expense of keeping them will depend on the question of winter eggs. It is contrary to the natural habits of chickens to lay in winter, and if left to themselves they will practically stop laying when they begin to moult or shed their feathers in the fall, and will not begin again until the warm days of spring. When eggs are scarce it will be a great treat to be able to have our own supply instead of paying a high price at the grocer's.

The fact that it is possible to get really fresh eggs in midwinter shows that with the proper care hens will lay. The average farm hen does not lay more than eighty eggs a year, which is hardly enough to pay for her feed. On the other hand, at an egg-laying contest held in Pennsylvania, the prize-winning pen made a record of 290 eggs per year for each hen. This was all due to better care and proper feed.

The birds were healthy pullets to begin with, they had warm food and warm drinking water throughout the winter, their coop was a bright, clean, dry place with an outside scratching shed. The grain was fed in a deep litter of straw to make them

work to get it and thus to obtain the necessary exercise to keep down fat. The birds in this contest were all hatched early in March and were all through the moult before the cold weather came. Most of the advertised poultry feeds for winter eggs are a swindle. If we give the birds proper care we shall not require any drugs. It is an excellent plan to give unthreshed straw to poultry in winter. They will work to obtain the grain and be kept busy. The usual quantity of grain for poultry is at the rate of a quart of corn or wheat to each fifteen hens. A standard winter ration is the so-called hot bran mash. This is made from wheat bran, clover meal, and either cut bone or meat scraps. It will be necessary to feed this in a hopper to avoid waste and it should be given at night just before the birds go to roost, with the grain ration in the morning, which will keep them scratching all day. Always keep some grit and oyster shells where the chickens can get it; also feed a little charcoal occasionally.

A dust bath for the hens will be appreciated in winter when the ground is frozen. Sink a soap box in a corner of the pen and sheltered from rain or snow and fill it with dry road dust. Have an extra supply to fill up the box from time to time.

The best place for a chicken house is on a sandy hillside with a southern slope. A heavy clay soil with poor drainage is very bad. Six-foot chicken wire will be high enough to enclose the run. If any of the chickens persist in flying out we must clip the flight feathers of their wings (one wing, not both). Do not put a top board on the run. If a chicken does not see something to fly to, it will seldom attempt to go over a fence, even if it is quite low.

It is much better to allow chickens full liberty if they do not ruin our garden or flower beds or persist in laying in out of the way places where the eggs cannot be found.

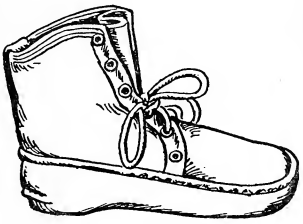
XII

WINTER SPORTS

What to wear — Skating — Skiing — Snow-shoeing — Hockey

IF ONE is fortunate enough to live in a part of the country where they have old-fashioned winters, the possibilities for outdoor sports are very great and the cold weather may be made the best part of the year for healthful outdoor exercise. To enjoy winter recreations properly we must have proper clothing. An ordinary overcoat is very much out of place, except possibly for sleighing. The regulation costume for almost any outdoor sport in winter is a warm coat, a heavy sweater, woollen trousers and stockings, and stout leather shoes. If in addition we have woollen gloves or mittens and a woollen skating cap or toque, we shall be enabled to brave the coldest kind of weather, provided of course that we have warm woollen underwear. Various modifications in this costume such as high hunting boots, or leggings and a flannel shirt worn under the sweater are possible. In the far North, the universal winter footwear is

moccasins. We must be careful not to dress too warmly when we expect to indulge in violent exercise. Excessive clothing will render us more liable to a sudden check of perspiration, a consequent closing of the pores and a resulting cold. Rubber boots or overshoes are very bad if worn constantly. The rubber, being waterproof, holds in the perspiration and we often find our stockings damp even when the walking is dry. Rubber boots also make our feet tender and cause cold feet. Tight shoes are also bad for the reason that they check circulation. The best footwear for a boy who lives in the country will be Indian moccasins or shoepacs worn with several pairs of lumbermen's woollen stockings. Such footwear would not do for skating, as they have no soles, but for outdoor tramping in the snow they are just the thing. No leather is thoroughly waterproof against snow water, but by frequent greasing with mutton tallow, neatsfoot oil or vaseline, shoes can be kept soft and practically waterproof as long as the soles and uppers are in good condition.

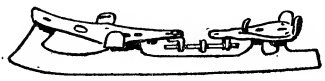


A shoepac

In all winter sports, especially in Canada, the custom is to wear gaily coloured goods. A mackinaw jacket made from the same material as a blanket, with very prominent stripes or plaids, is often worn. Closely woven goods are better than a thicker loose weave as they are lighter, warmer, and more waterproof.

Chief among winter sports is skating. There is no healthier recreation, provided that the ice is safe. Even in the coldest weather with the ice a foot thick or more we must always be sure to be on the lookout for air-holes or thin places over springs. It is said that ice an inch thick will hold the weight of a man, but it is better to be sure than to be sorry, and three or four inches are much safer.

A few years ago the height of the skater's art was so called "fancy or figure" skating, but recently the tendency has been for speed rather than for grace and the old-fashioned club skates have been replaced by racing or hockey skates with much longer runners. Fancy skating for prizes is governed by rules just as any other game or sport. The contestants do not attempt figures of their own invention but strive to excel in the so-called "com-



The club skate model

pulsory" figures. A fancy skater can practise from diagrams and directions just as one might practise moves in a game of chess. In printed directions for fancy skating the following abbreviations are used for the strokes:

R—right	T—three
L—left	L P—loop
F—forward	B—bracket
B—backward	R C—rocker
O—outside	C—counter
I—inside	

Supposing the figure to be executed to be the well-known "figure eight." It would be described as follows:

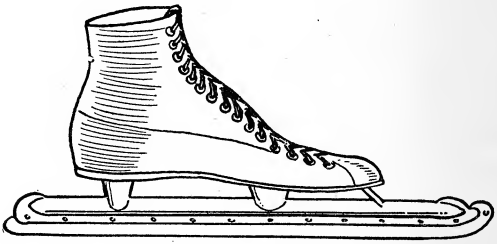
R-F-O L-F-O. R-F-I L-F-I. R-B-O L-B-O. R-B-I L-B-I.

By referring to the above table the skater can easily determine just what strokes are necessary to produce the figure properly.

Racing skates should be attached to shoes of special design either by screws or rivets. The most important thing is to have the blades carefully ground by an expert. They should be keen enough to cut a hair. To become a fast skater, practise if possible with an expert. Have him skate ahead of you and measure your stroke with his. By keeping your hands clasped behind your back your balance will not only be greatly improved but your

endurance will be doubled. The sprinting stroke is a direct glide ahead with the foot straight. A trained skater can go very long distances with very little fatigue but one must carefully measure his speed to the distance to be travelled. When you can cover a measured mile in three and one-half minutes you may consider yourself in the class of fast skaters.

Hockey skates are somewhat shorter than racing skates although built on the same general lines,



A hockey skate

the standard length being from nine and one-half to eleven and one-half inches. Hockey is one of the best winter games either outdoors or in a rink. The game of shinney or "bandy" as it is called in England has been modified in this country by substituting a flat piece of rubber weighing a pound called a "puck" for the india rubber lacrosse ball, which weighs but four ounces.

The best hockey sticks are made of Canadian rock elm.

The whole idea of hockey is to shoot the puck through your opponents' goal and to prevent them from shooting it through yours. In practice almost any number can play hockey and have plenty of

The hockey player's costume

exercise. The less experienced players should when securing the puck always shoot it as quickly as possible to a more experienced player on their own side to attempt shooting the goal. Skilful passing is the most important branch of hockey and consequently good team work is absolutely essential to success.

A regulation hockey team consist of seven players called goal, point, cover point, right centre, left centre, right wing, left wing.

The position of goal tender is the most difficult to acquire skill in. He stands directly in front of the goal and is expected to stop the puck with hands, feet, and body. While the position of goal does not involve much skating, a goal tender should also be a good skater. His position requires more nerve and cool-headedness than any other position on the team because the final responsibility of all goals scored against his team is up to him. His position is largely a defensive one and his work at times very severe. The goal keeper must very rarely leave his position but must depend upon the two other defensive men the "point" and "cover point" to stop the puck when it away from the direct line of the goal. The defensive men on a hockey team should not by any strategy or coaxing on the part of their opponents allow themselves to leave their own goal unprotected.

The forwards have most of the work of shooting goals and advancing the puck. Of course such a man must be very active and a good all round player. Hockey is a poor game in which to display grand-stand playing. The player's whole idea should be

to shoot the puck so that either he or some member of his team may score a goal.

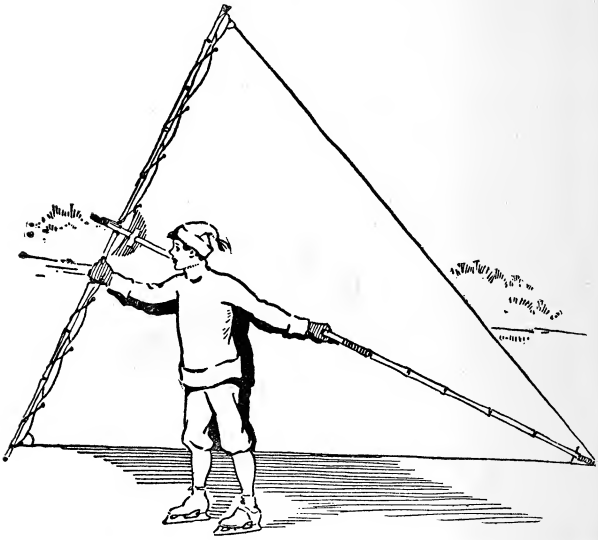
The rules of hockey are comparatively few and simple. The game consists of two twenty-minute halves with a ten-minute intermission between. In case of a tie at the end of a game it is customary to continue until one side secures a majority of the points.

A standard rink must be at least one hundred and twelve feet long by fifty-eight feet wide. Nets are six feet wide and four feet high.

One of the most exciting of winter sports is skate sailing. The same principles that are applied to sailing a boat are brought into play in sailing with skates. While considerable skill is necessary to handle a skate sail well, any one who is a good skater will soon acquire it. The direction that you go is determined by the angle at which the sail is held. When you wish to turn around or stop you simply shift its position until you run dead into the wind. A skate sail should be light and strong. A limit of five pounds' weight is all that is necessary. The sail is a very simple device. There are a great many kinds but one of the simplest is made from a T-shaped frame of bamboo with a V-shaped piece of canvas or balloon silk sewed or wired to the frame. The best skate sails are made with

a jointed frame like a fishing rod so that they may be taken apart and easily carried.

While an expert can handle a sail eight or ten feet wide and twelve feet high it is better for the beginner

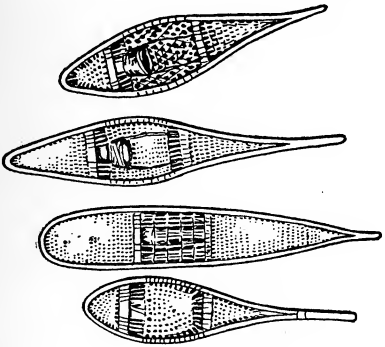


A skate sail

to start with one much smaller. The construction of the sail and the method of holding it are shown in the diagram.

Snowshoeing is another winter sport that will furnish a great deal of pleasure and will enable us

to be outdoors when our less fortunate friends may be cooped up in the house. There are a number of standard shapes in snowshoes, but probably the "Canadian" model will be found to be the most satisfactory generally. Snowshoes should be from twenty-four to forty-four inches long depending on

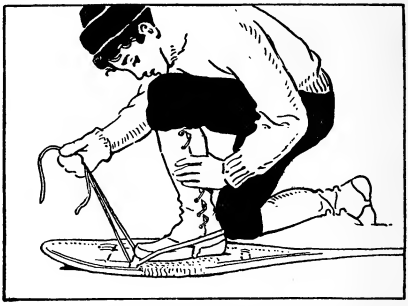


Four types of snowshoes

the weight to be carried. In order to enjoy snowshoeing we must use moccasins. The proper method of attaching the snowshoes is clearly shown in the diagrams. The beginner will find that snowshoeing is a very simple art to acquire, being far less difficult than skating and with far less danger of having a bad fall.

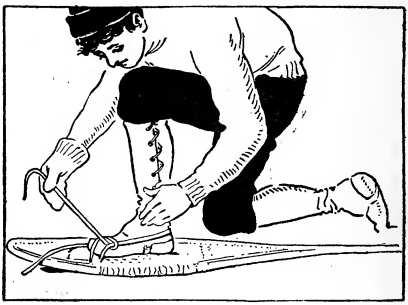
The sport of "ski-running" or skiing is practised more generally abroad than in this country. A

number of winter resorts owe their popularity largely to this sport. Skis are simply long flat pieces of wood



To throw the lumberman's hitch, start this way

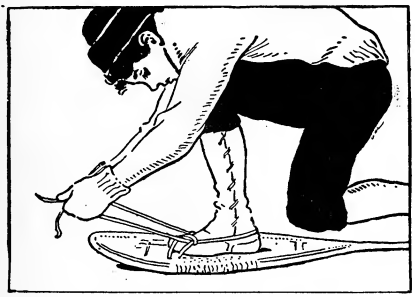
fastened or strapped to the shoes. The best type are the so called "Norway" pattern. Various



Then across the toe with both ends and under the loop

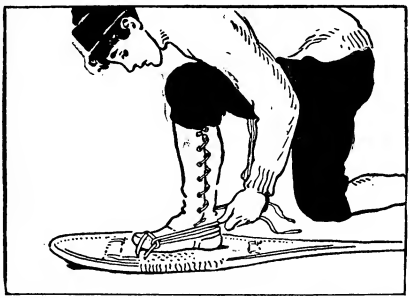
lengths are used from four to eight or nine feet long, but for a beginner the shorter ones will be better.

Ski-running is simply coasting down steep inclines on the snow with the skis used in much the same way



Draw the ends tightly forward to fasten down the toe

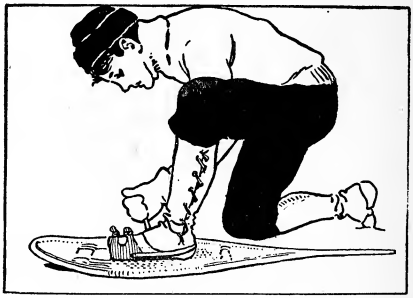
as a sled. The longer they are the greater the speed obtained, but the longer ones are also correspondingly hard to manage.



Then tie the ends together in a bow knot back of the heel

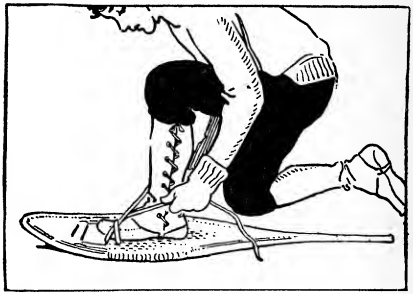
In Norway and Sweden skis are made to order just as we might be measured for suits of clothes.

The theory is that the proper length of ski will be such that the user, can, when standing erect



The straps over the toe remain buckled

and reaching above his head, just crook his forefinger over it as it stands upright. Ski shoes should

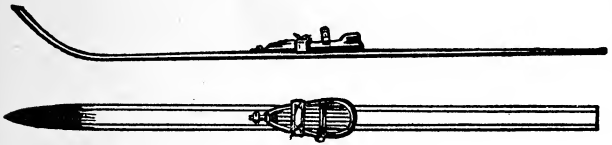


This is the "thong" hitch but it is not as good as the lumberman's hitch

be strong, with well blocked toes. A pair of heavy school shoes are just the thing if well made.

To learn skiing we should select the slope of a

hill not very steep and with no dangerous rocks or snags to run foul of. The best snow conditions are usually found two or three days after it has fallen. Fresh snow is too light to offer good skiing and snow with a crust is also bad. In running with skis on the level ground a long, sweeping stride is used somewhat after the fashion of skating. The



Front and side view of a ski

strokes should be made just as long as possible, and the skis kept close together. In going up an incline the tendency to slip backward is overcome by raising the toe of the ski slightly and bringing the heel down sharply. One foot should be firmly implanted before the other is moved. In going up a steep hill a zigzag course will be necessary.

As an aid in ski-running it is customary to employ a pair of ski poles, which are fastened to the wrist by leather thongs. They are usually made of bamboo or other light material with a wicker disk near the end to keep the pole from sinking into the soft

snow. Ski poles should never be used in attempting a jump, as under these circumstances they might be very dangerous.

Ski coasting is the sport that most boys will be interested in. To make a descent, begin at the top of a hill as one would in coasting with a sled and lean well forward with the skis parallel and with one foot slightly ahead of the other. The knees should be bent and the body rigid. The weight should be borne by the ball of the foot that is behind. As the start

A ski pole

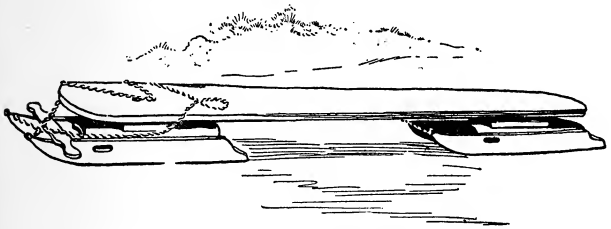
forward begins, the impulse will be to lean back, but this impulse must be overcome or you will take a tumble in the snow as you gain speed.

In jumping with skis an abrupt drop is necessary. For the beginner a few inches is sufficient. The start is made by coasting down an incline, and just before the take-off is reached, the runner assumes a crouching attitude and then straightens up quickly, maintaining an erect attitude until he is about to land, when, as in jumping, the knees are bent slightly to break the force of landing. During the flight the skis should be kept perfectly parallel but drooping slightly behind.

The Exciting Sport of Ski Running

The various forms of coasting with toboggan sleds and bobsleds are all well known to boys who live where there are snow and hills. A sled can be steered either by dragging the foot or by shifting the sled with the hands. Sleds with flexible runners have recently been introduced and are a great improvement on the old type.

One branch of carpenter work that nearly all



A bobsled or double runner

boys attempt at some time in their lives is to make a bobsled or double runner, which is a pair of sleds fastened on either end of a board long enough to hold from three to twenty or thirty people.

Coasting, especially with a bob, is somewhat dangerous sport, especially in cities or where the turns are sharp and there is danger of upsetting. A good bob is broad between the runners and low to the ground. The drawing shows one that almost any boy can make at little cost. Various devices are

used as brakes on a bob. Most of them are found to be out of order or frozen when the time comes to use them. A brake that is made from a piece of iron bent in an angle and fastened to the side of the runners on the rear sled is the best arrangement to have. A bobsled should not cost over ten dollars complete with steering wheel, bell, and necessary iron work, which should be made at the blacksmith's.

XIII

HORSEMANSHIP

How to become a good rider — The care of a horse — Saddles

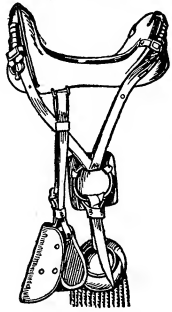
SO MANY branches of outdoor sport depend on a knowledge of horsemanship that every boy or girl who has the opportunity should learn to ride horseback. When once acquired, we shall never forget it. The first few lessons will make us feel discouraged, because the jolting and jarring every one receives in learning to ride almost make it appear that we can never acquire the knack, but remember that even the cowboy has had to go through the same experience. A beginner should only ride a gentle horse. In case we do take a tumble, it is well to take our first lesson on soft ground or in a tanbark ring.

There are three types of saddles generally used: The English saddle is simply a leather seat with stirrups, and while it is the most refined type and the one used for fox hunting and all expert riding in England, it is not the best kind to learn on.

The army saddle and the Mexican or cowboy saddle with a pommel or box-stirrups are far safer and less expensive. If you know of a dealer in second-hand army equipments you can buy a saddle and bridle of excellent material at less than half the retail price of the stores.

Before mounting your horse always examine care-

Mexican saddle



Army saddle

English saddle

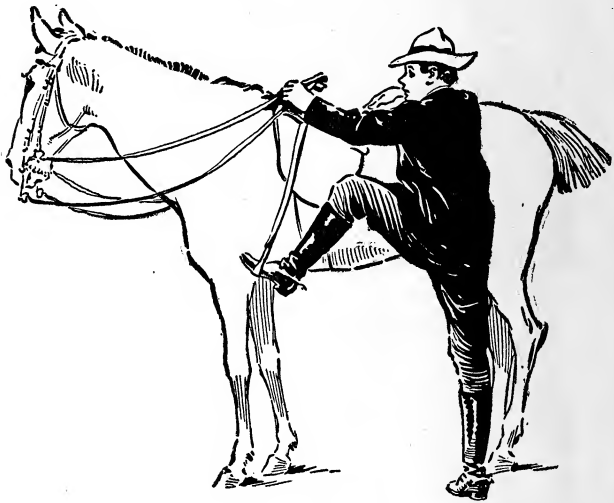
fully your saddle and bridle to see that the girths are tight, that the bridle is properly buckled, and the stirrups are the proper length. The latter is sometimes determined by placing the stirrup under the armpits and touching the saddle with the finger tips. A more accurate way is to have the straps adjusted after you are in the saddle. A beginner will prefer a short stirrup, but it is a bad habit to acquire. In mounting, stand on the left side and place the left

foot in the stirrup. Swing the right leg over the horse and find the right stirrup with the toe just as quickly as possible. Do not jerk a restless horse or otherwise betray your excitement if he starts. Let him see by your calmness that he too should be calm.

So much depends on the kind of horse you are riding that it will be difficult to say just how to handle him. A horse that is "bridle wise" is not guided in the customary way; that is, by pulling on the rein on the side you wish him to turn as one does in driving. A bridle-wise horse is guided by pressing the opposite rein against his neck. Such a horse is much easier to handle on horseback and we should try to teach our horse this method as soon as possible.

There is very close understanding between a horse and rider that does not exist when a horse is driven to a carriage. A horse can be guided simply by the leg pressure or spur. The proper seat is well back in the saddle with the toe pointing almost straight ahead. In order to learn to ride quickly we must overcome any strain or tension of our muscles and try to be flexible above the waist. In this way we soon accommodate our own motion to that of the horse. The most difficult gait to ride is the trot. There are two distinct styles of riding — to

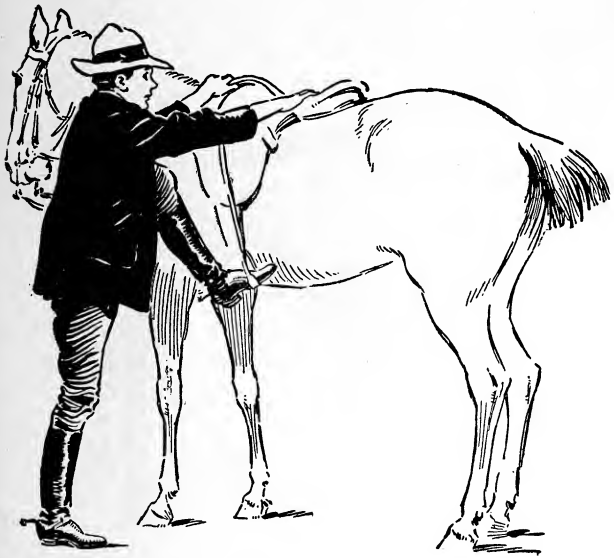
trot in English style of treading the stirrups, which necessitates rising from the saddle at every step of the horse, and the army style of simply sitting back in the saddle and taking the jouncing. Either



The wrong way to mount a horse — facing forward

method will prove very difficult for the beginner. A partial treading or easing up but not as extreme as the English style will probably be the best to acquire. So much depends upon the gait of a horse that we learn to ride some horses in a very few days, and would be several times as long with some others.

A horse that habitually stumbles is very dangerous. We must be sure our saddle horse is sure footed. In using English stirrups never permit the foot to go



The right way to mount — facing toward his tail

through the stirrup and rest on the ball. The toes should be in such a position that the stirrups can be kicked off at an instant's notice in case the horse falls with us.

In tying a saddle horse in the stable for feeding

or rest always loosen the girth and throw the stirrups over the saddle.

A saddle horse should always be spoken to gently but firmly. The horse can tell by your voice when you are afraid of him.

The canter is the ideal gait. After we once learn it, the motion of a good saddle horse is almost like a rocking chair and riding becomes one of the most delightful of outdoor pastimes. The boy who expects to go on an extended trip in the saddle should learn to care for a horse himself. A horse should never be fed or watered when he is warm unless we continue to drive him immediately afterward. Neglect of this precaution may cause "foundering," which has ruined many a fine horse.

The art of packing a horse is one which every one in mountain countries away from railroads should understand. Packing a horse simply means tying a load over his back. There are a great many hitches used for this purpose by Western mountaineers, but the celebrated diamond hitch will answer most purposes.

Hunting and steeplechasing, leaping fences and ditches, are the highest art of horsemanship. It is difficult to teach an old horse to be a hunter, but with a young one you can soon get him to take a

low obstacle or narrow ditch, and by gradually increasing the distance make a jumper of him.

The popularity of automobiles has caused the

Jumping fences is the highest art of horsemanship

present generation partially to lose interest in horseflesh, but no automobile ever made will furnish the real bond of friendship which exists between a boy and his horse, or will be a substitute

for the pleasure that comes from a stiff canter on the back of our friend and companion.

We do not really need an expensive horse. A typical Western or polo pony is just the thing for a boy or girl provided that it has no vicious or undesirable traits such as kicking, bucking, or stumbling, or is unsound or lame. It is always better if possible to buy a horse from a reliable dealer or a private owner. There is a great deal of dishonesty in horse trading and an honest seller who has nothing to conceal should be willing to grant a fair trial of a week or more.

To enjoy our horse to the fullest extent we should take entire care of him ourselves. He should be fed and watered regularly and groomed every morning until his coat shines. If we neglect a horse and allow his coat to become rough it is almost as bad as to neglect feeding him. Never trust the care of your horse too much to another. Even if you keep him in a public stable or have a man of your own to care for him, it is well to let them see that you are interested in giving your horse close personal attention.

XIV

HOW TO SWIM AND TO CANOE

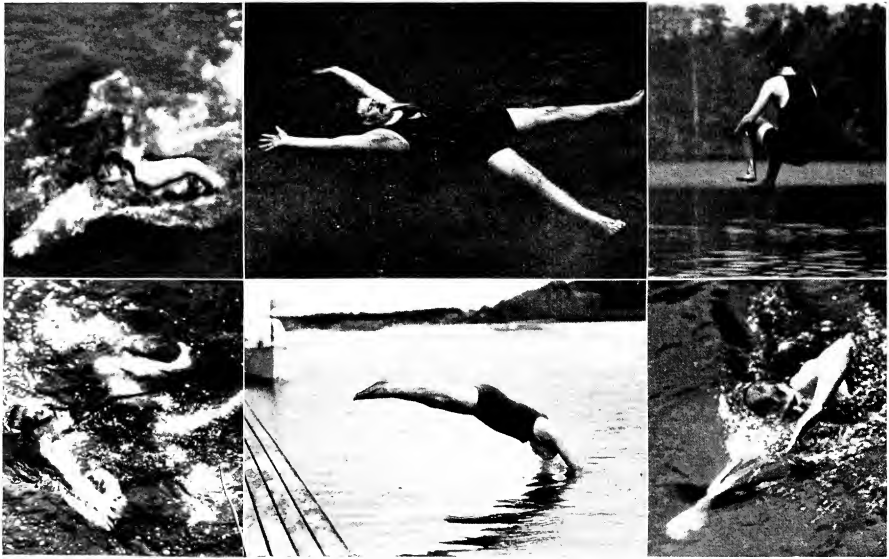
The racing strokes — Paddling and sailing canoes

IT HAS been said that the human being is the only animal that does not know instinctively how to swim without the necessity of being taught. If we take a dog or a horse or even a mouse and suddenly place it in the water it will immediately begin to swim, even though it has never seen a body of water larger than the source from which it obtains its drink. With a man or boy it is different, for the reason that with all the other animals the motions necessary to swim are those by which they walk or run; with a human being it is entirely an acquired stroke. After one becomes an expert swimmer he will find that he can keep afloat or at least keep his head above water, which is all there is to swimming anyway, by almost any kind of a motion. By a little practice we can learn to swim "no hands," "no feet," "one hand and one foot," by all sorts of twists and squirms and in fact to propel ourselves by a simple motion of the toes.

The first stroke that a self-taught small boy learns is what is called "dog fashioned." This name accurately describes the stroke, as it is in reality very similar to the motions by which a dog swims. No amount of book instruction can teach a person to swim, but a clear idea of the best general strokes will be of great assistance.

Swimming is probably the best general exercise among athletic sports. Practically every important muscle in the body is brought into play, and measurements show that swimmers have the most uniform muscular development of any class of athletes. After we learn to swim, the distance that we are capable of going is largely dependent upon our physical strength. Almost any man can swim a mile if he begins slowly and with the same regard for conserving his strength that a runner would have in attempting a mile run.

However skillful one is as a swimmer, a proper respect for the dangers of the sport should always be present. To take unnecessary risks, such as swimming alone far beyond reach of help or jumping and diving from high places into water of uncertain depth is not bravery; it is simply foolhardiness. A good swimmer is a careful swimmer always. The beginner must first of all try to overcome his natural



Photograph by A. R. Dugmore

Swimming is One of the Best Outdoor Sports

fear of the water. This is much harder to do than to learn the simple motions of hands or feet that makes us keep afloat and swim. Nothing will help to give us this confidence more quickly than to take a few lessons from some one in whom we have confidence and who will above all things not frighten us and so get us into danger. With a good teacher, a boy should be able to learn how to swim in two or three lessons. Of course he will take only a few strokes at first, but those few strokes, which carry with them self-confidence and which make us feel that swimming is not so hard an art after all, is really half the battle. After we are at least sure that we can get to shore somehow, we can take up all the finished strokes which make a fancy swimmer.

There are a number of strokes used in swimming and especially in racing. The common breast stroke is the first one to learn. In this the swimmer should lie flat on his breast in the water and either be supported by the hand of his teacher or by an inflated air cushion. The hands are principally used to maintain the balance and to keep afloat. The real work should be done with the legs. We learn to use the hands properly in a very short time, but the beginner always shows a tendency to forget to kick properly. For this reason swimming teachers

lay great stress on the leg motion and in a measure let the hands take care of themelves. In swimming the important thing is to keep our heads above the water, a simple statement, but one that beginners may take a long time to learn. The impulse is not only to keep our heads but our shoulders out of the water also, and this is a feat that even an expert can not accomplish for very long. If we can allow ourselves to sink low in the water without fear, and if we can also remember to kick and, above all, to make our strokes slowly and evenly, we shall very soon learn to swim. I have frequently seen boys learn to swim in a single afternoon. Another tendency of the beginner is to hold his breath while swimming. Of course we cannot swim very far or exert ourselves unless we can breathe. We should take a breath at each stroke, inhaling though the mouth and exhaling through the nose, which is just the opposite to the hygienic method of land breathing. Whatever may be our methods, however, the main thing is not to forget to breathe, which always results in finishing our five or ten strokes out of breath and terrified.

A great deal may be learned about swimming strokes by practice on land. In fact some swimming teachers always follow the practice of teaching the

pupil ashore how to make the stroke and how to breathe correctly. A small camp stool or a box will give us the support we need. The three things to keep in mind are the leg motion and the taking in of the breath through the mouth as the arms are being drawn in and exhaling as they are pushed forward. It is better to learn to swim in salt water, for the reason that it will support the body better. An additional advantage is that we always feel more refreshed after a salt-water bath.

If we take up fast swimming, we must learn one of the various overhand or overarm strokes. The chief difference between these strokes and the simple breast stroke is that the arms as well as the legs are used to propel the body through the water, and this power is applied so steadily and uniformly that instead of moving by jerks we move with a continuous motion and at a greater speed. The single overarm is easier to learn than the double overarm or "trudgeon" stroke. This latter stroke is very tiring and while undoubtedly faster than any other when once mastered, it is only used for short sprints. Most of the great swimmers have developed peculiar strokes of their own, but nearly all of them have adopted a general style which may be called the "crawl."

There are many fancy strokes in swimming that one may acquire by practice, all of which require close attention to form rather than speed, just as fancy skating is distinguished from racing. One of the simplest tricks to learn is called "the rolling log." We take a position just as we would in floating and then exerting the muscles first of one side and then the other we shall find that we can roll over and over just as a log might roll. The idea in performing this trick successfully is not to show any apparent motion of the muscles.

Swimming on the back is easily learned and is not only a pretty trick but is very useful in giving us an opportunity to rest on a long swim.

A perfect dive

Diving is also a branch of swimming that requires confidence rather than lessons. A dive is simply a plunge head first into the water. A graceful diver plunges with as little splash as possible. It is very bad form either to bend the knees or to strike on the stomach, the latter being a kind of dive for which

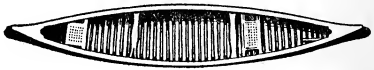
boys have a very expressive though not elegant name. Somersaults and back dives from a stationary take-off or from a spring-board are very easily learned. We shall probably have a few hard splashes until we learn to turn fully over, but there is not much danger of injury if we are sure of landing in the water.

Water wings and other artificial supports are very useful for the beginner until he has mastered the strokes, but all such artificial devices should be given up just as soon as possible, and, furthermore, as soon as we can really swim, in order to gain confidence, we should go beyond our depth, where it will be necessary to swim or drown.

A swimmer should always know how to assist another to shore in case of accident. It is not nearly so easy as one who has never tried it might think. A drowning person will for the time being be panic-stricken and the first impulse will be to seize us about the neck. Always approach a drowning person from the rear and support him under an armpit, meanwhile talking to him and trying to reassure him. Every year we hear of terrible drowning accidents which might have been avoided if some one in the party had kept his head and had been able to tell the others what to do.

I have placed canoeing and swimming in the same

chapter because the first word in canoeing is never go until you can swim. There is practically no difference between the shape of the modern canoe and the shape of the Indian birch bark canoes which were developed by the savages in America hundreds of years ago. All the ingenuity of white men has failed to improve on this model. A canoe is one of the most graceful of water craft and, while it is regarded more in the light of a plaything by



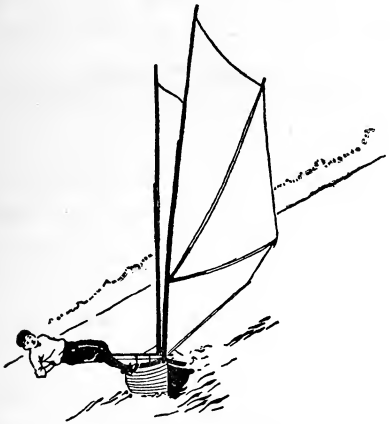
A typical Indian model canoe

people in cities, it is just as much a necessity to the guides and trappers of the great Northern country as a pony is to the cowboy and the plainsman. The canoe is the horse and wagon of the Maine woodsman and in it he carries his provisions and his family.

While a canoe is generally propelled by paddles, a pole is sometimes necessary to force it upstream, especially in swift water. In many places the sportsman is forced to carry his canoe around waterfalls and shallows for several miles. For this reason a canoe must be as light as possible without too great a sacrifice of strength. The old styles of canoes made of birch bark, hollow logs, the skins of

animals and so on have practically given way to the canvas-covered cedar or basswood canoes of the Canadian type.

It will scarcely pay the boy to attempt to make his own canoe, as the cost of a well-made eighteen-foot canoe of the type used by professional hunters and trappers is but thirty dollars. With care a



A sailing canoe in action

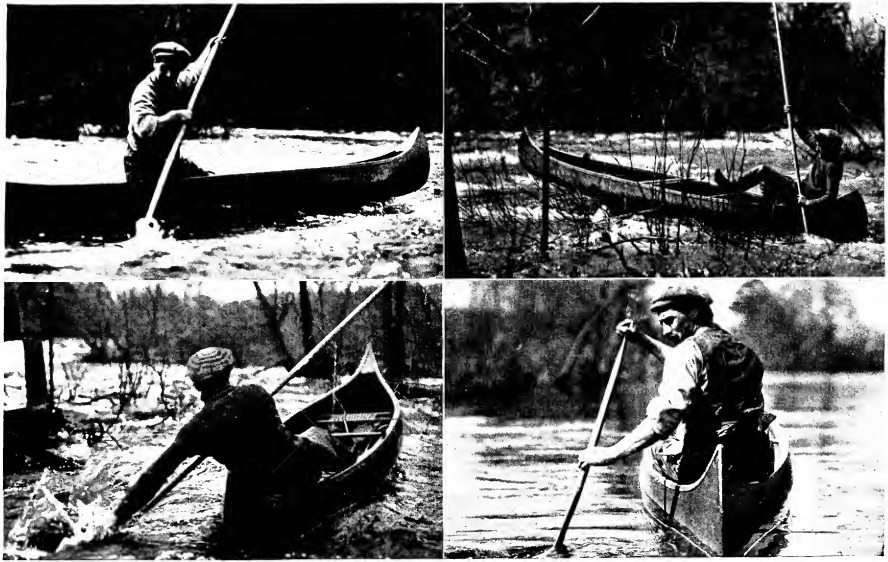
canoe should last its owner ten years. It will be necessary to protect it from the weather when not in use and frequently give it a coat of paint or spar varnish.

Sailing canoes are built after a different model

from paddling canoes. They usually are decked over and simply have a cockpit. They are also stronger and much heavier. Their use is limited to more open water than most of the rivers and lakes of Maine and Canada. Cruising canoes are made safer if watertight air chambers are built in the ends.

Even if a canoe turns over it does not sink. Some experts can right a capsized canoe and clamber in over the side even while swimming in deep water. The seaworthiness of a canoe depends largely upon its lines. Some canoes are very cranky and others can stand a lot of careless usage without capsizing. One thing is true of all, that accidents occur far more often in getting in and out of a canoe than in the act of sailing it. It is always unsafe to stand in a canoe or to lean far out of it to pick lilies or to reach for floating objects.

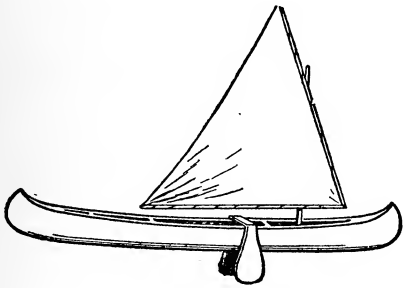
Canoes may be propelled by either single or double paddles, but the former is the sportman's type. It is possible to keep a canoe on a straight course entirely by paddling on one side and merely shifting to rest, but the beginner may have some difficulty in acquiring the knack of doing this, which consists of turning the paddles at the end of the stroke to make up the amount that the forward stroke deflects the canoe from a straight course.



Photographs by A. R. Dugmore

In Canoeing Against the Current in Swift Steams a Pole is Used in Place of the Paddle

An open canoe for paddling does not require a rudder. A sailing canoe, however, will require a rudder, a keel, and a centreboard as well. Canoe sailing is an exciting and dangerous sport. In order



A type of sailing canoe

to keep the canoe from capsizing, a sliding seat or outrigger is used, upon which the sailor shifts his position to keep the boat on an even keel. The centreboard is so arranged that it can be raised or lowered by means of a line.

XV

BASEBALL

How to organize a team and to select the players — The various positions — Curve pitching

BASEBALL is called the National Game of America just as cricket is regarded as the national game in England. The game received its wide popularity directly after the Civil War by the soldiers who returned to all parts of the country and introduced the game that they had learned in camp. Almost every village and town has its ball team, in which the interest is general. It is not a game for middle-aged men to play, like golf, but if one has been a ball player in youth the chances are that he will keep his interest in the game through life. Baseball is largely a game of skill. It does not afford nearly as much opportunity for physical exercise as tennis or football, and because of the professional games it is not always conducted with as high a regard for sportsmanlike conduct, but it has a firm hold on the American public, and the win-

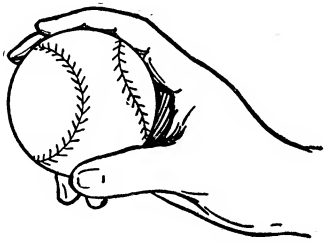
ning of a championship series in the professional leagues is almost a national event.

Every boy knows that a baseball team consists of nine players, the positions being pitcher, catcher, first base, second base, third base, and shortstop, which are called the in-field, and right-field, centre-field, and left-field, which positions are called the out-field. The umpire has a very important position in baseball, as his decisions in a close game may result either in defeat or victory for a team. An umpire should always be some one who knows the rules thoroughly and who is not too greatly interested in either team. He should always try to be fair, and having once made a decision be sure enough of himself to hold to it even if the whole opposing team may try by "kicking" to cause him to change. Much of the rowdyism in baseball can be attributed to this cause. A good ball player is first of all a boy or man who shows himself to be a gentleman under all circumstances.

In baseball, like many games where winning is sometimes the important thing rather than fair play, the real benefits of the game are lost sight of in the desire to have a higher score than one's opponents. Probably the most clean-cut games are played by school and

college teams, which should always be strictly amateur.

The pitcher has the most important position on the team. If by his skill he is able to deceive the opposing batsmen and cause them to strike out or to make feeble hits, the rest of the team will have but little to do except of course to bat when their turn comes and try to score runs. Baseball has become a very scientific game in recent years and the sustained interest in it year after year is largely due to the fact that the regular attendants at a game have learned to understand and to appreciate the finer points of the game almost as well as the players them-



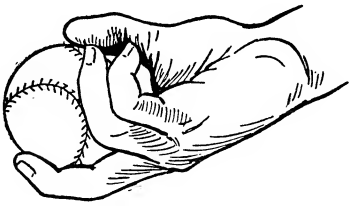
The in-curve

The out-curve

selves. While it might appear to a beginner that the battery does all the work in a game, as a matter of fact every man on the nine is supposed to do his part in backing up every play and to be in the right place at the right time.

A good pitcher must be able to pitch a curved ball. This art will only come with constant practice. Until about forty years ago a curve was unknown. In the old days the number of runs scored in a game was very high, it being a common thing for a winning team to make twenty to thirty runs. The rules of baseball are changed frequently and almost every change has been made with a view to restricting the batsman. As a consequence, in modern games the

The drop



The out-drop

scores are very low and sometimes neither side will score a single run in a tie game of ten or twelve innings.

In modern baseball a team that plays together frequently has a prearranged code of signals that are understood by each member of the team. It is very important for every player on a side to know whether the pitcher intends to deliver a high or a low ball or one that may either be batted well into the out-field or probably be a grounder that will be taken care of by some one on the in-field. Of course these things do not always work out as is planned. The pitcher may not have good control of the ball or pitch wild, the catcher may make a bad "muff" and let the ball get by him, or what we expect to be a bunted ball may be a home run, but all of this is part of the sport and helps to make baseball one of the most interesting and exciting of games. In any case there is no question that nine boys who are accustomed to play together and who understand each other's methods of play and signals will have a better chance of winning a close game than nine other players who may have a shade the better of it in individual work but who do not play together.

Most games are won or lost in a single instant at a crucial moment when some one fails to make good,

or who, usually in the case of a pitcher, lets up on his speed or accuracy just at the critical time. The National Championship of 1908 was decided in favour of Chicago because one of New York's players in the deciding game of the season failed to touch second base when the last man was out. The game had been won by New York except for this mistake, and the result was that another game was played, which Chicago won before the largest crowd that probably ever assembled to witness a game of baseball.

When a baseball team is organized, the first thing to do is to elect a captain from one of the players, and after this is decided every boy on the team should give him absolute support and obedience. A team should also have a manager whose duties are to arrange games with other teams of the same class, to arrange for the transportation of players and, in fact, to attend to all the business duties of games that come outside of actual playing. Usually a boy is chosen for manager who is not a ball player himself, but who has shown an interest in the team. The captain should be a boy who first of all knows the game and who has the respect and coöperation of the other players. The position that he may play on the team is not so important, but usually

it is better to have some one from the in-field as captain, as he will be in a better position to keep close watch on the progress of the game and to give directions to the other players.

In case of a disputed point it is better to allow your captain to make a protest if such is necessary. Observance of this rule will prevent much of the rowdyism that has characterized the game of baseball. No boy should ever attempt to win games by unfair tactics. The day of tripping, spiking, and holding is gone. If you are not able by your playing to hold up your end on a ball team you had better give up the game and devote your attention to something that you can do without being guilty of rowdyism.

Strict rules of training are not as necessary for baseball players as for some other branches of sport, because the game is not so strenuous nor does it involve such sustained physical exertion, but any boy will make a better ball player as well as a better man if he observes the rules of training, such as early hours for retiring, simple food, and regular systematic exercise.

The battery of a team is an exception to the rule regarding strict training. Both the pitcher and catcher should be in the best physical condition.

A pitcher who stands up for nine innings is obliged to do a tremendous amount of work and if he becomes tired or stiff toward the end of the game he will probably be at the mercy of the opposing batsmen.

Usually the pitcher of a team is a boy who is physically strong and who can stand hard work. The other positions, however, are usually assigned because of the build of the individual player. The pitcher, however, may be tall or short, fat or thin, so long as he can pitch.

The pitcher is the most important member of a ball team. Most of the work falls to him, and a good pitcher, even with a comparatively weak team behind him, can sometimes win games where a good team with a weak pitcher would lose. A good pitcher must first of all have a cool head and keep his nerve even under the most trying circumstances. He must also have good control of the ball and be able to pitch it where he wants it to go. After that he must have a knowledge of curves and know how by causing the ball to spin in a certain way to cause it to change its course and thus to deceive the batsman. The art of curving a ball was discovered in 1867. Before that time all that a pitcher needed was a straight, swift delivery. The three general classes of curved balls used to-day are the

out-curve, the in-curve, and the drop. There are also other modifications called "the fade away," "the spitball," and others. Curve pitching will only come with the hardest kind of practice.

In general the spin is given to the ball by a certain use of the fingers and the method of releasing it. It is necessary to conceal your intentions from the batsman in preparing to deliver a curve or he will divine your intention and the effort may be wasted. All curves are produced by a snap of the wrist at the instant of releasing the ball. Excellent practice may be had in curving by pitching at a post from a sixty-foot mark and watching to see the effect of various twists and snaps. Pitching is extremely hard on the arm and practice should be very light at first until the muscles become hardened. Even the best professional pitchers are not worked as a rule oftener than two or three games a week.

A good baseball captain always tries to develop several pitchers from his team. It is of course very desirable to have a "star pitcher" who can be depended on, but if the star should happen to be ill or to injure his fingers on a hot liner or for some reason cannot play, unless there is a substitute, the effect of his absence on his team will be to demoralize it. For that reason every encouragement should be

given to any boy who wants to try his hand at pitching. If a game is well in hand it is usually safe to put in a substitute pitcher to finish it. This is done in college teams for the reason that no amount of practice is quite like playing in an actual game.

It may be said to guide the beginner that the method of producing curves varies greatly with different pitchers, but that in general the out-curve is produced by grasping the ball with the first and second fingers and the thumb. The grip for this curve should be tight and the back of the hand turned downward. The out-curve can be produced either with a fast ball or a slow one.

For the in-curve a swinging sidearm motion is used, the ball being released over the tips of the first two fingers with a snap to set it spinning. It may also be produced by releasing the ball over all four fingers.

The grip of the ball for the drop is very similar to the out-curve, but in delivery the hand is brought almost directly over the shoulder. In all curves the pitcher must have extremely sensitive fingers and be able to control them with almost as much skill as one requires in playing a piano. We must keep in mind which way we desire the ball to spin to produce the required curve and then to give it

just as much of this spin as we can without interfering with our accuracy.

No two pitchers will have the same form or manner of delivery. In learning to pitch, the main thing is to adopt the delivery that seems most natural to you without especial regard to form, and with no unnecessary motions.

A pitcher must always be on the alert and keep a close watch on the bases when they are occupied. He must not, however, allow the remarks of coacher or spectators to cause him to become rattled or confused. Baseball at best is a noisy game, and a pitcher who is sensitive to outside remarks or joshing will never be a real success.

The catcher is usually a short, stocky player with a good reach and a quick, accurate throw. He is usually the acting general in a game and signals to the whole team. The principal test of a good catcher is to be able to make a quick, swift throw to second base without being obliged to draw his arm fully back. Such a ball is snapped from the wrist and should be aimed to catch the base runner who is attempting to steal the base. This play is very common in ball games, and as there is only a difference of an instant in the time that it takes a runner to go from first base to second, who starts

just as the pitcher delivers the ball, and the time it takes a pitched ball to be caught by the catcher and snapped to second, a game may be won or lost just on this play alone. If the opposing team finds that it can make second in safety by going down with the pitcher's arm, it will surely take full advantage of the knowledge. To have a man on second is disconcerting to the pitcher as well as a difficult man to handle. It therefore follows that a catcher who cannot throw accurately to the bases becomes a serious disadvantage to his team. In the old days a catcher had to be able to catch either with bare hand or with a light glove, but the modern catcher's mitt, mask, chest-protector, and shin-guards make the position far safer, and almost any boy who is quick and has nerve can be trained to become a fairly good catcher so long as he has a good throw and is a good general.

The first baseman is usually a tall boy who is active and who can cover his position both in reaching for high balls and in picking up grounders. Of course in a baseball score the first baseman will score the largest number of "put outs," because practically all he is obliged to do is to cover the base and to catch the ball before the runner gets there. It is in fielding his position and in pulling down balls

that are thrown wildly that the first baseman can show his chief skill.

The positions of second base and shortstop are practically the same, and these two players should understand each other perfectly and know just when to cover the base and when to back up the other. Neglect of this precaution often results in the most stupid errors, which are discouraging alike to the team and the spectators. Both players should be quick and active, with an ability to throw both over and under handed as well as to toss the ball after picking it up on the run. The shortstop is often the smallest man on a team, due no doubt to the theory that his work is largely in picking up grounders.

The shortstop is often led into habits which are commonly known as "grand-stand plays"; that is, he attempts to make difficult plays or one-handed stops with an unnecessary display of motions, to bring the applause of the spectators. No ball player was ever made by playing to the audience. Good form is not only very desirable but very necessary, but the main thing in ball playing is to play your part and to forget that there is such a thing as an audience or applause. If your form is good so much the better, but if by paying too much

attention to it you miss the ball and score an error, your team may suffer defeat on account of your pride. The main thing is to get the ball and after that to to do it as gracefully as possible. One-handed stops are well enough when you cannot get both hands on the ball, but an error made in this way is not only the most humiliating kind but also the most inexcusable.

It must not be inferred that grand-stand playing is confined to the shortstop. Any member of the team can be guilty of it. No player, no matter how good he may be, should be allowed to hold his position on a team unless he is willing to do his best at all times and unless he feels that the game is not lost nor won until the last man is out.

Many experienced players consider that the most difficult position to play well is third base. This player has to be ready for slow bunts as well as hard drives; he must cover a lot of ground and try to get every ball that comes near him. At the same time he must cover his base to stop the base runner from advancing home. He will be obliged to stop hot liners with one hand and often while on the run to make an accurate throw to first base.

Out-fielders are usually chosen because of their ability to bat as well as to be quick on their feet

and catch fly balls on the run. Fielders should practise if possible to catch the ball in a throwing position, so that no unnecessary time may be lost in getting the ball back to the in-field. Of the three fielding positions, right-field is by far the most important. He must be sure of ground balls as well as flies and also, in common with all the fielders, be a good judge of the batsmen and try to be where the batted ball is going. The centre-fielder must be especially quick on his feet, as he is expected to back up both shortstop and second base as well as to run in for line hits that just go over the in-fielders' heads. The ability to start quickly when running for a ball can be greatly developed by practice and will greatly improve the player's game.

Very often a fly ball will fall in such a position that the out-fielders will be in doubt who is to take it. The result is usually a collision, a missed ball and a chorus of groans from the spectators. The remedy for this is to arrange beforehand for the second baseman to call out who in the case of a doubtful ball is to take it. All of these things are part of the finer points of the game and will only come from practice. A boy who really desires to become proficient in his position will try to avoid changing from one position to another, but decide

which position he likes to play best or is best fitted for and try to get all the practice possible. An excellent opportunity will come from studying the methods of a good player in the same position, noting carefully what he does on each play, how he backs up the other players and how he fits in the general plan of team work.

It is a great advantage to any player to learn as much as he can about the skill and methods of his opponents. Some men cannot hit a low ball or a high one, some will flinch when the ball comes close to them, giving the pitcher a chance to deliver a straight, swift ball over the inside of the plate, which the umpire will call a strike even though the batsman devotes all of his energy to getting out of the way.

A left-handed thrower will seldom make a success as a ball player except as pitcher or on first base. Left-handed batsmen, however, are a distinct advantage to a team, as nothing will so disconcert a green pitcher as to have batsmen standing first on one side of the plate and then on the other.

Every boy who plays baseball must know the rules thoroughly to be a success. It is in this way that advantage of every fair opportunity can be taken. Nothing is so disheartening to a team as

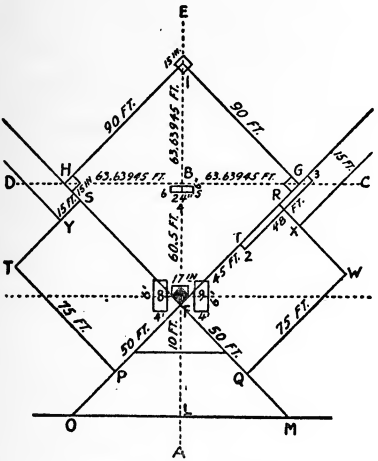
to lose a closely contested game on a technicality of rules.

Batting and base running are two departments of the game where one member of the team is as important as another. A good batsman must have a quick eye and a quick brain. When he decides to strike at a ball he must not change his mind and simply swing at it feebly after it is in the catcher's hands. The best batters are not those who hit the ball the hardest. Judgment in placing hits is far more important than trying to knock out a home run every time you are at the bat. You must remember that the pitcher is studying your batting methods and you must try just as hard to deceive him as he is trying to deceive you. Many a game has been won by a man who knew how to wait at the bat instead of swinging wildly at everything just for fear of having strikes called.

When you hit the ball there is only one rule — run. You will very soon find out whether the ball is fair or foul or whether there is any chance of making first base. A base runner should never stop trying to make a base until the ball is in the hands of the baseman. One never can tell when a ball may be fumbled or muffed.

A baseball diamond should be a part of a town

just as is the public square or a town hall. The distance between the bases should be ninety feet and the four base-lines should form a square and all the angles should be right angles. The three bases should be canvas bags filled with sawdust and fastened to their positions by pegs that are driven



How to lay out a baseball field

into the ground. The home plate should if possible be a piece of whitened rubber. A board securely fastened will do.

The pitcher's box should be denoted by a strip of wood or rubber 24 inches long and 6 inches wide.

This and home plate should be buried so that they are flush with the surface of the field. The pitcher's box on a full-sized field is exactly 60½ feet from home plate.

The standard baseball is the kind used by professional players. It is covered with horsehide, and is warranted to last an entire game without ripping or getting out of shape. Baseball bats are made of a variety of woods, the common materials being ash, willow, and hickory. A bat must not exceed 2¾ inches in thickness at its thickest part. There are a great many shapes and models named after the professional players who use them. The shape of a bat does not make as much difference as some poor batters are inclined to think. The manufacturers of sporting goods make all the accessories for playing baseball both in men's and boys' sizes. Every ball player should own his own mitt or glove and become accustomed to it. The same is true of his bat.

The art of becoming a good ball player depends largely on the boy himself. No one plays ball naturally. It all comes with practice, and it follows that the more practice we can get the better ball players we shall become. It is a game where a loss of nerve is absolutely fatal to good work. A player

must keep his head no matter how trying the circumstances may be. Cool-headedness is especially important and the surest way to develop it is to be just as indifferent to the criticism of the crowd or your fellow-players, so long as you know that you have done your best, as you should be to their applause. Just play the game for all there is in it, and you will be sure to become a moderately good player even though you may not be a star. In field practice, when some one is batting out balls to you, try just as hard to stop and field each ball that comes within reach as you would if the result of the game depended on it. It is only by this means that you can hope to become a finished ball player. You can never learn by lying around in the shade and telling your friends how good you are going to be in the coming match game.

A regularly organized ball team should always adopt some club colours and be provided with uniforms. Very good ones complete with shirt, pants, stockings, belt, and cap can be purchased of sporting goods outfitters for two or three dollars a suit (when ordered in lots of nine or more). They can also sometimes be made more cheaply at home if mothers and sisters are willing. The shirt should always be lettered with the name or initials of the team.

Baseball shoes are usually provided with steel plates or leather knobs. Spikes are very dangerous and should not be permitted. The regulation baseball shoe reaches just under the instep.

The rules of baseball are too long and complicated to be published here. Almost every year many important changes are made to improve the sport and to make it harder for the batsmen to make runs. All of this tends to make the game more interesting and to develop it from a scientific side.

When a team is playing away from its home grounds the choice of innings — *i. e.*, who is to bat first — goes to the home team.

A game consists of nine full innings unless called by rain, darkness or for some other cause. If five complete innings have been played when the game stops, the score always stands and the team ahead is declared the winner. In case of a tie at the end of the game the play continues until at the completion of a full inning one team is ahead. That ends the game and the team ahead is the winner.

In arranging games with visiting teams it is customary to make some arrangement as to expenses, share of gate receipts or other guarantee. It is very important in order to avoid unpleasant disputes to have this matter fully understood and agreed

upon by the managers of each team before the game starts.

On account of fences, houses, and other obstacles that some baseball fields have it is customary for the umpire to decide what are called "ground rules" before the game starts. The principal thing that mars a good game of ball next to kicking and wrangling is the tendency of the crowd to get on the field and to interfere with the players. An easy remedy for this is simply to call the game until the spectators take their proper places.

Baseball is a good game if it is properly played. It is unfortunate that so many amateur games are spoiled because some of the players lose their tempers in their anxiety to have their wrongs righted. No matter how good a ball player a boy is he will never get the real benefit of the game unless he remembers that it is not the one who loses his temper but "he who ruleth his spirit" that is really entitled to the respect of his fellows. Make up your mind to abide by the decision of the umpire just as a soldier obeys the orders of his superior officer. It is the easiest thing in the world for an umpire to make a mistake, but he will be far less likely to correct his errors if nine angry boys are all talking to him at once than if your captain quietly goes to him with

the rules or the facts behind him and states the case. It is an old saying but none the less true that "oil catches more flies than vinegar."

A boy who has developed a healthy interest in baseball while young will probably never lose it in after life even though his opportunities to play or even to see a game are few. I once met a mining man in the interior of Mexico, a hundred miles from a railroad and in a town where only three people spoke the English language, and this man had not been to his home town in ten years, but he had followed his baseball team through the papers all those years and could tell you more about the players than many a man living in the town where the team played.

Such a man is what the newspapers call a "fan," which is an abbreviation of the word "fanatic." There is no harm in being a baseball enthusiast, provided that we do not allow it to interfere with our work or allow our desire to witness games to take the place of systematic exercise for ourselves.

XVI

HOW TO PLAY FOOTBALL

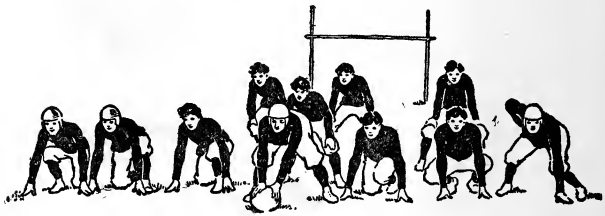
The various positions and how to select men for them — Team work and signals — The rules

FOOTBALL is usually played in the fall of the year because the exercise that it involves is so violent that to attempt it at any other time would probably result in injury to the players. The cool, frosty days of October and November make baseball out of season, and such weather is ideal for football.

So much has been said and written about the dangers of football as a sport that many parents have strong objections to permitting their sons to play. There is no question that it is a hard game and not suited to weaklings, but a strong, healthy boy can play football under proper conditions and with proper training quite as safely as he can do many other things to which parents raise no objections, such as wrestling, climbing trees, playing hockey, or even performing difficult feats

of gymnastics or acrobatics in a gymnasium. Every year there are a number of serious accidents from football, but there are also injuries from other games, and people are injured who play no games at all, so it simply is a question whether we are willing to take the chances of a sprained ankle or broken bone for the love of one of the best of outdoor sports.

The recent changes in rules have made football



The lineup

a much safer game than it was in the early nineties, when such plays as the "flying wedge" and line bucking were practically all there was to the game. To any one who does not understand football it seems as though it were played with practically no science and with but few rules. As a matter of fact a well-coached college team will sometimes have sixty or seventy separate plays each of which has been carefully practised and which requires each

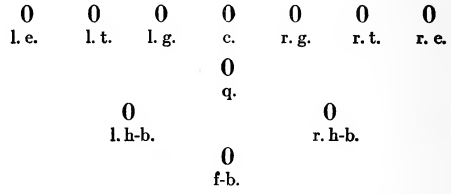
man on the team to do something to help make the play successful, while on the other hand each man on the opposing team is doing his best to cause the play to fail. The result to any one not understanding the game is simply a confused mass of struggling men and a final tumble with a pile of legs and arms flying about.

The American game of football called Rugby is a development of the English game, but the present game is very different from the English game of soccer or association football, in which kicking predominates and where a round ball is used instead of the oval-shaped American football.

Numerous efforts have been made to introduce the game of soccer into this country, but the long popularity of the American game and the strong support that has been given to it by the colleges have prevented soccer from gaining much of a foothold.

Football is played by two opposing teams of eleven men each. The positions are right and left end, right and left tackle, right and left guard, centre rush, quarter-back, right and left half-backs and full-back.

The manner in which they line up is shown in the accompanying diagram.



The weight and size of the men on a football team largely govern the positions where they play. The centre rush and the two guards are usually the heaviest men on the team, as extra weight in the centre of the line is important to prevent what is called "bucking the centre." The two tackles should be strong, stocky players, not too tall, but still with sufficient weight to enable them to keep their feet in a mass play and to offer strong resistance to a united attack on their position. They should also be quick and agile and be able to advance the ball by rushing when called upon. The two ends must be fleet of foot and quick, sure tacklers. With the constant changes in football rules the position of end has become more and more important, until now a team with weak, slow ends is almost like a baseball team with a poor pitcher.

Many people regard the position of quarter-back

as the most important on the team. He is virtually the field captain. A good quarter-back must be an all around player of the highest order. He must first of all have a good head and be able to run off the plays of his team without confusion. He must keep his head under the most trying circumstances. He must watch for weak places in the opposing team and direct the play of his men against them. He must offer encouragement to his own team and be always on the alert to capture a fumbled ball, stop a runner who has eluded the tacklers or to catch a punt that may come within his reach. In nearly all the big college games the quarter-back is one of the star players. The nature of his many duties is such that he is forced to be a grand-stand player and to be conspicuous even though he may not desire to. In running back punts the quarter-back will often be used because he is sure in catching them, which is a matter of the greatest importance. And all of this work is required of a man who is usually the smallest, lightest man on the team and who alongside of the giant guards and centre sometimes looks like a pigmy. There is no higher honour in football than to be a good all around quarter-back.

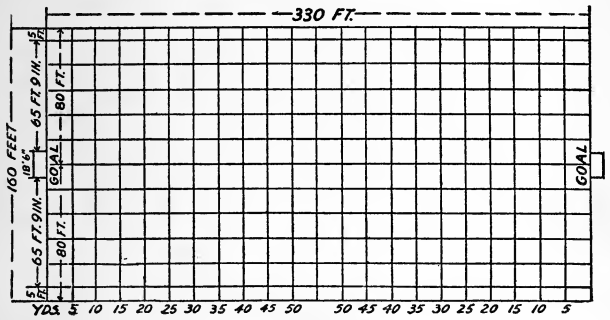
The half-backs are chosen because of their speed

and their ability to advance the ball and to elude the tackling of the opposing team. They come in for a very large share of the work and must be boys of superior strength and agility.

Next to the quarter-back the player of the greatest importance is full-back. His duty first of all is to attend to the kicking end of the game. For that reason he must practise constantly both with punts and drop kicks and be able to put the ball between the goal-posts from all angles and distances within reason. A great many games are won by a good drop kicker making a field goal at a critical time, and such a man is of the highest value to a team. As drop kicking, like pitching in baseball, comes largely from practice, the captain or manager of a team should see to it that any member of his team who shows any ability at all in this department should be given every opportunity and encouragement to develop his skill. A good drop kicker can be used temporarily from almost any position in the line, whether he be guard, tackle or end. As a rule, however, the full-back is the player who does most of the kicking. He must also be a good line bucker and be able to gain the required distance when called upon.

In general, then, we choose the three centre men

because of their weight, the tackles and ends for speed and ability in tackling, the quarter-back for his all around ability and his generalship, the half-backs because of their skill in rushing the ball, and the full-back for the kicking department. Any man on the team may be chosen captain. As his work is largely done in practice and in perfecting plays, unless a team is in the hands of a coach it is better not to add the duties of captain to the



A football gridiron

already overburdened quarter-back. Otherwise he is the logical and ideal man for the position.

There is no game in which team work is more important than in football. Eleven boys of moderate ability and comparative light weight who can execute their plays with skill and precision

can beat a team of heavier boys or superior players who may lack their skill and organization. In the case of a school team it is almost always possible to secure the services of a coach from among the graduates. If such a one has had experience on a college team so much the better.

A football field is 330 feet long by 160 feet wide. At each end are goal posts set 18 feet 6 inches apart, with a crossbar 10 feet above the ground. The field is marked off in chalk lines similar to a tennis court, these lines being 5 yards apart. The centre of the field where the play starts is 55 yards from either end. It is usually customary to run lines parallel to the sides of the field, also 5 yards apart, but as a field is but 160 feet wide the first and last of these lines are but 5 feet from the side lines instead of 5 yards. The lines on a football field make a checkerboard effect and have given to the field the name of "gridiron."

Football is a game where eleven men try to force the ball back of the opposing players' goal line by various efforts in running with it or in kicking, while the opposing team meanwhile, by throwing the runner or by pushing him back, try to prevent any gain being made. Each team is allowed a certain number of attempts to make a certain

distance and, if they fail to do this the ball becomes the property of the other team to make a similar attempt. Each of these attempts is called a "down," and, according to the rules, after three attempts, if the runners have failed to gain the required distance, the ball is given to their opponents. In practice it is customary for a team to kick the ball on its last down and thus to surrender it just as far from its own goal line as possible. The distance that must be made in three downs according to the present rules is ten yards. Sometimes a team will not kick on its last down because the distance remaining to be gained is so little that the quarter-back feels sure that one of his men can make it, but this is an exception. When ten or more yards are gained the ball becomes at first down again and the team has three more attempts to make another ten yards figured from where the ball was finally downed.

The ultimate object of "rushing the ball," as this play is called, is to place it on the ground behind the enemy's goal line, which is called a "touchdown." Sometimes a team will succeed in getting the ball almost over the goal line and then because of the superior resistance of its opponents will find that it can advance it no further. It is then customary

for one of the players who has had practice in drop kicking to attempt to kick what is called a "goal from the field" or "field goal." This play counts less than a touchdown in the score, counting but three points, while a touchdown counts five, but many a game has been won by a field goal.

Football scores between evenly matched teams who play scientifically are usually low, one or two scores in a game being all that are made. It frequently happens that neither side will score, but, unlike baseball, the game does not continue after the time limit has expired, but simply becomes a tie game. The game is divided into four periods of fifteen minutes each. There are resting periods of three minutes each between the first and second and third and fourth periods, and fifteen minutes between the second and third periods.

At the beginning of the game the two opposing captains toss up a coin and the winner of the toss has the choice of goals or of the ball. His decision will be governed by the position of the sun and the wind conditions, two very important things in football. After each score the sides change goals, however; so the choice is not so important unless the game happens to be scoreless.

At the first play the ball is placed in the centre

of the field and is kicked off, a man on the opposing team trying to catch it and to run back as far as possible before he is tackled and the ball "downed." The next lineup takes place at this point and the game proceeds until a score is made. After each score the ball is put in play just as at the beginning of the game.

The quarter-back calls out a series of numbers and letters called "signals" before the ball is put into play. These signals will tell his team what the play is to be, whether a run around end, a kick, or a mass play on centre, for example. The matter of thorough coaching in signals is very important and must be practised by the team until it can tell in an instant just what the play is to be when the play starts. The centre stoops low and holds the ball in an upright position on the ground between his feet. The quarter-back is directly behind him with outstretched hands ready to receive it. After the signal is given the team must be ready to execute the play, but must not by look or motion permit its opponents know what the play is to be. At a touch or word from the quarter-back, the full-back snaps the ball back and the play starts.

The position of the men on a team is generally as the diagram shows but for various plays other

formations are used, provided that they do not violate the rules, which specify just how many men must be in the lineup and how many are permitted behind the line.

The first requirement of signals is to have them simple. In the heat and stress of a game the players will have but little time to figure out what the play is to be, even though it may all have seemed very simple on paper.

To begin a code of signals each position on the team is given a letter. The eleven positions will require eleven letters and no two must be alike. It would be possible of course to simply start with the letter "a" and go to "k," but this system would be too simple and easily understood by your opponents. A better way is to take a word easily remembered in which no letter occurs twice, such as "B-l-a-c-k-h-o-r-s-e-x" or any other combination. "Buy and trade," "importance," "formidable," and many others are used. The same principle is used by tradesmen in putting private price marks on their goods.

Take the words "buy and trade" for example. Their positions right and left end, abbreviated (r.e. and l.e.), right and left tackle (r.t. and l. t.), right and left guard (r.g. and l.g.), centre (c.),

quarter-back (q.), right and left half-backs (r.h. and l.h.), and full-back (f.b.), would be assigned letters as follows:

l.e.	l.t.	l.g.	c.	r.g.	r.t.	r.e.	q.	l.h.	f.b.	r.h
B	*U*	*Y*	*A*	*N*	*D*	*T*	*R*	*A*	*D*	*E*

The letters denote not only players but holes in the line, as the spaces between the players are called. The quarter-back always adds to his signal a number of other letters or figures which have no meaning, simply to confuse the opposing players. For example the signal given is "24-E-N-72-X." The figures 24 and 72 mean nothing, nor does the "X." The signal says "E will take the ball and go through N," or right half-back through right guard. Any number of other plays can be denoted by letters or numbers, for example all punts by figures which are a multiple of ten, as 10-20, 150-300, and so on.

The beginner in football should first of all be provided with a suitable uniform; there is no game in which this is more important. The game is rough and many and harsh are the jolts we receive; consequently we must use whatever padding and guards we can to provide against injury.

The custom is to wear a tight jersey with elbow pads, a tight-fitting canvas jacket and well-padded

canvas khaki or moleskin trousers. The appearance of our uniform is of little consequence, as football players are not noted for the beauty of their costumes. Heavy woollen stockings and football shoes complete the outfit. The shoes are the most important part of the uniform. They should lace with eyelets and be well provided with leather cleats to prevent slipping.

Football shoes

A beginner at football can gain a lot of valuable points by carefully watching the practice of his team from the side lines. He is then in a position when called upon to fill a given position which he may be trying for, without obliging the coach or captain to give him instruction in many rudiments which he can just as well learn from observation. He must also be thoroughly familiar with the rules and their interpretation. A violation of the rules in football carries with it a severe penalty for the team, provided of course that the referee sees it, consequently,

a beginner must be especially careful not to permit his anxiety to make a good showing to result in being offside when the ball is put in play, interfering with a man about to make a fair catch or in doing many other things which the excitement of the game may occasion.

The moment of putting the ball into play is called a "scrimmage" and the scrimmage continues until the ball is downed. A ball is "down" when the runner is brought to a standstill or when he touches the ground with any part of his body except his hands or feet. At this point the referee will blow his whistle and a lineup for a new scrimmage will take place.

The football uniform

When the ball is kicked, a member of the opposing team who raises his hand and stands in one spot is entitled to make a catch without interference, which if successful gives his team a free kick. In a free kick his opponents may not come within ten yards of where the ball was caught and some member of his team may kick either a drop kick,

punt or place kick as he sees fit. After a touchdown, which counts five, a place kick for goal is attempted. If the ball goes between the goal-posts and above the crossbar it counts one point additional for the team making the touchdown, or six in all. A score of one alone cannot be made in football, as the attempt for goal cannot be made until after a touchdown. This of course does not apply to a field goal, which may be attempted at any time while the ball is in possession of the team and which counts three.

The smallest score is from a "safety," which results when a member of a team is forced to touch the ball down behind his own goal or is downed there by the opposing team. This play counts two for his opponents and is an evidence of weakness of the team. It has the advantage, however, of permitting the ball to be brought out twenty-five yards to be put into play.

The rules of football were practically unchanged for a number of years, but the game developed so many dangerous features that nearly all the colleges recently agreed to certain important changes especially directed to abolishing mass play and line bucking. For that reason the rules for the present game may be changed considerably within a few years.

A boy taking up football should therefore acquaint himself with the latest rules governing the sport.

Football requires careful training, but the best training will come from actual play itself. In the beginning of the season a period of ten minutes' hard play is all that a boy should be called upon to do, unless he is in excellent physical shape. After that the time of practice should be lengthened until a candidate can go through a game of two full halves without being exhausted. One reason for many football injuries is that the players become so completely winded that the ordinary power of resistance is lost.

Besides actual play the best training is in taking long runs to improve the wind, one of the most essential things in football. In the colleges training for nearly all athletic events is done in this way and a candidate who cannot go out with his squad and run four or five miles at a stiff dog trot will have but little chance of making his team.

XVII

LAWN TENNIS

How to make and mark a tennis court — Clay and sod courts — The proper grip of the racket — Golf — The strokes and equipment

THE steady growth in popularity of lawn tennis as well as the splendid exercise that results from playing this game has given it a sure place in the field of athletic sports. It is a game that requires a great deal of skill, and as no one realizes this fact more than those who are experts, a beginner should not be deterred from playing tennis simply because he may fear the criticism of the more experienced. The only way to learn the various strokes and to be able to play a good game is to practise at every opportunity. It is better to play against some one who is more skilful than ourselves and who will keep us on our mettle to make a good showing.

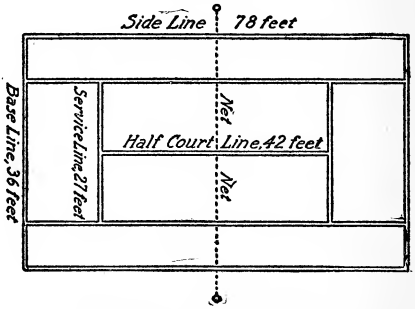
The eye and the muscles must work automatically and with precision. No amount of written instructions can give us this skill. The personal outfit for playing tennis is of course very simple. Every

player should own his racket and become accustomed to it. They cost almost any price up to eight dollars, which will buy the very best rackets made. The weight and size of the racket will depend on our strength. The average weight for a man is about fourteen ounces and for a boy an ounce or two lighter. A skilful player becomes so accustomed to the feeling and weight of his own racket that often he will play an indifferent game if he is forced to use any other.

The game of lawn tennis was first played on a lawn or grass court, and many players still prefer this kind of a court, but the difficulty of obtaining a good sod, and after having obtained it the greater difficulty of keeping it in good condition, have increased the popularity of a skinned or clay court, which is always in fair condition except immediately after a heavy rain. The expense of maintaining a tennis court is more than most boys or most families would care to undertake.

As a rule, tennis courts fall in the same general class with golf links in that they lend themselves readily to the joint ownership of a club or school, where the expense falls on a number rather than on an individual. In a great many places the boys of a town or village have clubbed together and have

obtained permission from some one owning a piece of vacant ground that is not likely to be sold or improved within a few years and have built a tennis court on it. This arrangement helps the appearance of the land, that should be secured at a very low, rental, or none at all if the owner is public spirited and prefers to see the boys of his town grow up



The dimensions of a tennis court

as healthy, athletic men rather than weaklings who have no place for recreation but in the village streets, where passing trucks and automobiles will endanger their lives, or at least cause them to be a nuisance to the public.

To build a tennis court properly means a lot of work and it should only be attempted under the direction of some one who understands it. The things most important are good drainage, good light,

and sufficient room. A double court is 36 feet wide by 72 feet long, but in tournament games or on courts where experts play it is customary to have an open space about 60 feet wide by 110 to 120 feet long, to give the players plenty of room to run back and otherwise to play a fast game. A court should always be laid out north and south or as near these points of the compass as possible. In courts running east and west the sun is sure to be in the eyes of one of the players nearly all day; this is of course a very serious objection. While it is very pleasant to play tennis in the shade of a tree or building, a court should never be located under these conditions if it is possible to avoid it. A properly placed court should be fully exposed to the sun all day.

First of all it will be necessary to decide whether a grass or "dirt" court is to be built. If the grass is fine and the place where the court is to be happens to be level, there is little to do but to cut the sod very short with a lawn-mower and to mark out the court. If, on the contrary, there is much grading or levelling to be done, a dirt court will be much cheaper and better in the end, as constant playing on turf soon wears bare spots. The upkeep of a grass court will be expensive unless it is feasible to move its position from time to time.

Whatever the court is to be, the first question to consider is proper drainage. If the subsoil is sandy the chances are that the natural soakage will take care of the surplus water, but on the contrary, if the court is at the bottom of a hill or in a low place where clay predominates, it is necessary to provide some means of getting rid of the surplus water from rainfalls or our court may be a sea of mud just when it would be most useful to us. To level a court properly we shall need the services of some one expert with a levelling instrument of some kind. It is not safe to depend on what seems to be level to our eye, as our judgment is often influenced by leaning trees, the horizon, and other natural objects. With a few stakes driven into the ground, the tops of which are level, we are enabled to stretch lines which will give us our levels accurately.

A court should have a slope of a few inches from one end to the other to carry off water. After the level is determined, all there is to making a court is to fill in or cut away soil and earth until the proper level space is obtained. As a rule it is better to dig away for a court rather than to fill in, as we thus obtain a better bottom and one that will require but little rolling. In the case of a slope, it is well so to locate the court that the amount of earth

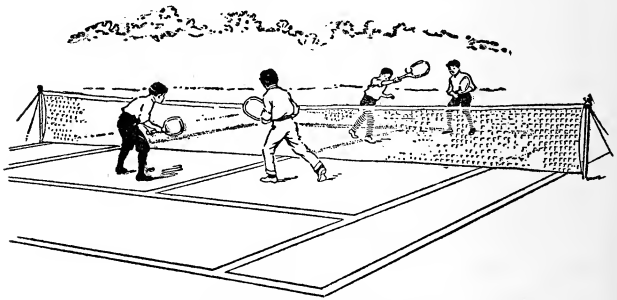
excavated from one end will be just about sufficient to fill in the other.

The final surfacing of a court is done by means of clay and sand in the proportion of about four or five to one, the clay of course being in excess. To mix clay and sand thoroughly, the former should first be pulverized thoroughly when dry and the mixture sifted over the court carefully and evenly. The next step is rolling and wetting, and more rolling and wetting until finally the whole is allowed to dry and is ready for play. The slight irregularities and roller ridges that often appear in a court will soon be worn off by the players' feet, but playing of course will not change the grade. A new court will be greatly improved by use, but no one should be allowed on a court except with rubber-soled shoes. Heeled shoes will soon ruin a court, and it is bad practice even to allow any one to walk over a court unless with proper footwear.

The preliminary levelling of a court can be accomplished with a rake and a straight-edged board, but after the clay has become packed and hard it will be necessary to use considerable force in scraping off the inequalities. A metal cutting edge, such as a hoe or scraper, will be found useful. A court should be swept with a coarse broom to dis-

tribute the fine material evenly. Another very good sweeper can be made from a piece of wood about six or eight feet long to which several thicknesses of bagging have been tacked or fastened.

The final step in making a court consists in marking it out. Most courts are marked so that they will be suitable either for singles or doubles or so that



A game of doubles in lawn tennis

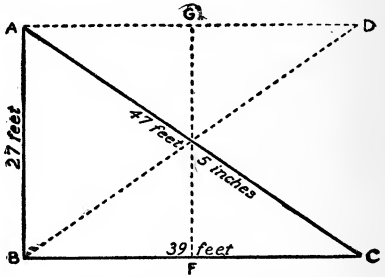
either two or four people can play at a time. Where tape markers are to be used, the proper distances will appear on the tape without measuring, but if lime is used for marking a careful plotting will be necessary to secure the proper distances, after which the corners should be indicated by angle irons, so that the court may be re-marked at any time without re-measuring.

Considerable difficulty is often experienced by

beginners in marking out a court, and, in fact, it is not a simple matter. The first thing of importance is to determine generally one corner of the court and to get a base line and a side line at a true right angle of ninety degrees. The same principle may be employed that is used by builders and surveyors in "squaring a building," as it is called.

You will need a ten-foot pole with marks for the feet indicated on it in lead pencil, and in addition to this a few 20-penny spikes and a ball of stout twine. Drive a nail into the ground where you want one corner of the court and fasten the line to it; then stretch the line to another nail to mark either a side line or back line. You will then have one side and the corner fixed, and the problem is to get another line at right angles to it. Boys who have studied geometry know that "in a right-angle triangle the square of the hypotenuse is equal to the sum of the squares of the other two sides." It isn't necessary to understand this, but it is the principle employed in "squaring." You next stretch another line and have some one hold it. On the fixed side line you measure eight feet from the corner nail and mark it with a piece of twine tied around the line. You also make a six-foot mark on the line to be at right angles to it, the exact direction of which is yet to be

determined. Both of these measurements must be accurate. The boy on the end of the loose line moves it until the distance between the two pieces of twine is exactly the length of your ten-foot pole. The angle thus formed is exactly ninety degrees, or a right angle. Having obtained one side and one end, to finish marking is simply a matter of making the necessary measurements of a court as shown on



How to mark out a tennis court

the diagram and marking each intersecting point with a nail driven into the ground.

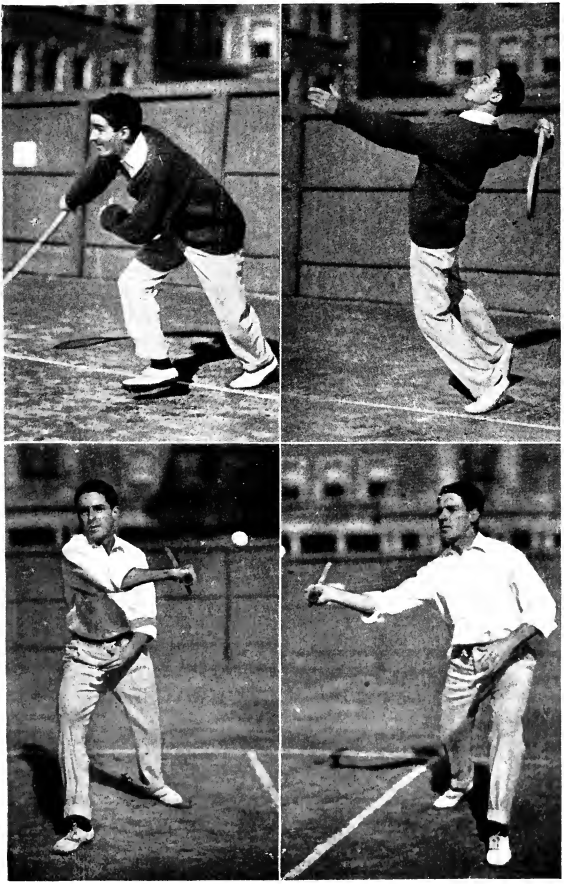
Another way to lay out a court is to drive two stakes or nails into the ground 27 feet apart. (The line of these stakes should be the position of the net.) Then take two pieces of twine, one 47 feet 5 inches long, and the other 39 feet. Fasten one line to each of the spikes that you have placed 27

feet apart. Where the two lines meet as they are pulled taut are the true corners of the court, as there are only four points where they can meet. The various measurements can then be marked as above by referring to the diagram. It is customary to mark a double court and to indicate the lines for singles afterward.

The game of tennis may be played either by two or four persons, or sometimes an expert player will stand two beginners. The ball used is rubber filled with air and covered with white felt and is 2½ inches in diameter. It is necessary to play with two balls, and to save time in chasing those that go wild it is customary to play with three or four.

One of the players begins by serving. The selection of the court is usually chosen by lot or by tossing up a racket in a way similar to tossing a cent. The side of the racket where the woven gut appears is called "rough," and the other side "smooth." This practice is not to be recommended, as it injures the racket. It is better to toss a coin. The game of tennis consists in knocking the ball over the net and into the court of your opponent, keeping up this volley until one side or player fails to make the return properly or at all, which scores

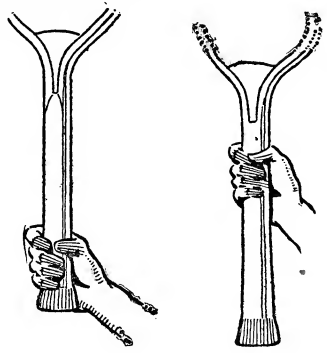
his opponent a point. While a game in tennis consists of four points, the simple numbers from one to four are not used. The points run 15, 30, 40, game, when one side makes them all. Or it may be "15–30," "15 all," and so on, the score of the server being mentioned first. Where one side has nothing their score is called "love." When one side has scored four points the game is won — with this exception: When both sides are tied at 40, or "deuce," as it is called, the winners must make two points more than their opponents to win. In this way the game may be continued for a long time as the points are won first by one side and then by the other. The score at deuce, or "40 all," will be denoted as "vantage in" or "vantage out," depending upon whether the server's side or the other wins one of the two points necessary to win from "deuce." If first one side, then the other, obtains one of these points the score will be "vantage in" or "out," as the case may be, and then "deuce" again, until finally when two points clear are made it is "game." A set of tennis consists in winning six games, but in this case also there is a peculiar condition. Where each side wins five games it is necessary in order to win the set to obtain a lead of two games. The score in games is then denoted just



Photographs of Tennis Strokes Taken in Actual Play

as in a single game, "deuce" and "vantage" games being played until a majority of two is won.

To learn the game of tennis, first obtain a proper grip of the racket. It should always be held firmly and as near the end as possible, the leather butt being inside the hand. A loose grip will absolutely prevent a player from becoming expert, as the accuracy and quickness that are a part of tennis can never be obtained unless we have the racket under perfect control. The various backhand, high and low strokes will only come from constant practice. The most important stroke to master as well as the most difficult is a swift, accurate service. A player who is otherwise a fair player can easily lose game after game by not having mastered his service stroke, and thus he beats himself without any effort on the part of his opponent. The various "twist" services have almost passed out of use. Even the best players employ a straight,



a *b*

a the right and *b* the wrong way to hold a tennis racket

swift overhand ball. To fail to serve the ball over the net and in the proper place is called a "fault." The player has two chances and to fail in both is called "a double fault." A common mistake is to attempt a swift smash on the first ball, which may fail half the time, and then to make sure of the second ball by an easy stroke which a skilful opponent can return almost at will and thus either extend us to the utmost to return it or else make us fail altogether. It is better to make sure of the first serve than to attempt a more difficult serve than our skill will permit.

GOLF

The game of golf, while of comparatively recent introduction in this country, has sprung rapidly into popularity. It is hard to say just why it should be such a popular game except that it combines a certain amount of healthful outdoor exercise with an unlimited opportunity for skill, and in addition to this, unlike the more violent games, it can be joined in by old as well as young. The proper construction and maintenance of a golf course is an expensive proposition. A private course is altogether out of the question except for the very wealthy. A club in starting with a limited amount

of money will find it more satisfactory to begin with the construction of a nine-hole or even a six-hole course rather than to attempt a full course of eighteen holes which will be indifferently constructed or

Addressing

At the top of the swing

kept up. The average eighteen-hole course is about three miles long and is built acccording to the general lay of the land. A hole in golf consists in the stretch between the "tee," from which the ball is knocked off, and the "putting green," where the player "putts" the ball into the "hole" — a

can sunk into the ground which has about the same diameter as a tomato can. The score consists in the number of strokes required to make the hole, and of course the player making the fewest number of strokes is the winner of the hole or match.

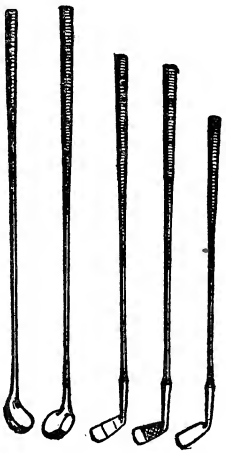
Just before the ball is struck

Golf has but few rules. The secret of playing well consists in being able to swing the clubs with accuracy and precision. There is no game where proper form counts for more and none in which more careful preliminary instruction by an expert is so important. If one can at the very outset obtain the services of a professional or a skilful player for a few lessons, it will do far more good than ten times as many lessons after we have contracted bad habits which will have to be unlearned.

The surest way to be a poor golfer is first to think

How An Expert Plays Golf

that it is a sort of "old man's game," or, as one boy said, "a game of knocking a pill around a ten-acre lot"; then when the chance to play our first game comes along to do it indifferently, only to learn later that there is a lot more to the skill of a good player than we ever realized. Another very common mistake is to buy a complete outfit of clubs, which a beginner always improperly calls "sticks," before we really know just what shape and weight of club is best adapted to our needs.



A good outfit of clubs for golf

The common clubs in most players' outfits consist of a driver, brassie, cleek, iron, and putter. We can add to this list almost indefinitely if we wish, as there are all sorts of clubs made for various shots and with various angles. The game of golf consists in covering a certain fixed course in the fewest number of shots. We shall have to practise both for distance and accuracy. The first few shots on a hole of average length will give us an opportunity

for distance. This is especially true of the first shot, or drive, but after that we make what are known as approach shots—that is to say, we are approaching the putting green where we complete the hole by "putting" the ball into the tin cup sunk into the ground. On the green we shall need to be very careful, as a stroke wasted or poorly played counts just as much against our score if the ball goes only a few feet as if we sliced or "foozled" our drive.

In scoring for golf there are two methods: Either the score of each hole is taken and the winner of a majority of holes wins the match, or the total score in counted as in "medal" or "tournament play."

"Bogie score" is a fictitious score for the course that is supposed to denote perfect playing without flukes or luck. The mysterious "Colonel Bogie" is an imaginary player who always makes this score.

XVIII

PHOTOGRAPHY

The selection of a camera — Snapshots vs. real pictures — How to make a photograph from start to finish

ASIDE from our own pleasant recollections, an album of photographs can be the most satisfactory reminder of the good times we have had on some vacation or outdoor trip.

Photography has been made so easy and so inexpensive by modern methods that every one should have some kind of a camera. Small instruments capable of taking really excellent pictures within their limits can be bought for five dollars or even less. Of course we cannot hope often to obtain pictures that will be really artistic with such a small outfit, but sometimes the inexpensive cameras will give remarkably good results.

Snapshot pictures seem to fill such an important place in our outdoor life that no vacation or excursion trip seems to be complete unless some one takes along a camera.

The modern way of taking pictures, which is

simply pressing a button and sending a film to the professional to "do the rest," including developing, printing and mounting, is really not photography. Almost any one can take pictures with a small hand camera. The manufacturers have perfected instruments so complete for this kind of work that there is very little for us to do beyond being sure that we have an unexposed section of film in place and that we have sufficient light to obtain a picture. Of course we must have the focus right and must be sure we are pointing at what we wish to take.

Real photography is quite different from snapshot work. It is a hobby so fascinating and with such great possibilities that there is scarcely anything that will give a boy or girl more real pleasure in life and a better opportunity to be outdoors than to become an expert outdoor photographer. Unfortunately it is a rather expensive pastime, but even with a moderate priced instrument we can obtain excellent results under the right conditions. I have seen a prize-winning picture in an exhibition that was made with a cigar box, with a pinhole in one end for a lens.

Even though one does not care to become an expert photographer, by all means get a camera and make snapshots. It is quite a common idea for

an amateur to attribute his failures to defects in his material or outfit. You may be sure when you fail it is your own fault. Dealers in photographic supplies constantly have complaints from customers about defective materials, and certainly nine out of every ten of these cases are simply due to the carelessness of the operator with perfectly good material.

It is well for a beginner in photography to start with a simple snapshot camera. They can be bought for three or four dollars up to twenty-five. Such cameras are used with films, and simply require the operator to expose his film in plenty of light and with the proper attention to the distance that the object to be photographed may be from the camera. Until we can accurately estimate distances, such as 8, 15, 25 or more feet, it will be far safer to pace off the distance, remembering that a long step for a boy is about equivalent to three feet. Some cameras have a universal focus and require no adjusting, but an adjustable camera will usually give better results.

Some cameras are so constructed that they may be used either as a hand machine or on a tripod for view work. They can also be adapted either to films or plates and be operated with the ground

glass for focussing, or if desired, the focussing scale and view finder may be used.

The size of our camera will depend largely upon our purse. The cost of the camera itself is not the only thing to consider. All the plates and supplies increase in proportion to the size of our instrument. A good all around size is 4 x 5, or if we really wish to become photographers the 5 x 7 is a standard. A number of new sizes have recently been introduced and have proven very satisfactory. Perhaps the best size for a snapshot camera is 3¼ x 5½.

There are a great many makes of cameras on the market, but even at the risk of advertising one firm more than another it is only fair to say that there is really nothing better in pocket snapshot machines than the kodaks. In view cameras it is different. There are instruments of a dozen makes any of which will produce excellent results. The tests to apply in selecting a view camera are its workmanship, compactness, and the various attachments and conveniences it has. The salesman from whom you purchase will explain fully just what its possibilities are, especially if you take some experienced person with you who can ask questions.

Suppose you begin photographing with a simple

"snapshot" outfit. The first thing to remember is that there is absolutely no excuse for the large percentages of failures that beginners have in making pictures, and which are due solely to their own carelessness and inattention to simple details. First of all, immediately after making an exposure, be sure to form the habit of turning the key until a fresh film comes into place; then you will never be troubled with the question whether you have exposed the film or not. Every professional photographer who develops for amateurs handles many films in which some of the negatives are blank and some are double negatives with two pictures on one film. This is solely the fault of the photographer, who was never quite sure and would first make the mistake of exposing a film twice, then turning the roll without exposing it at all. If you are really in doubt, it is better to turn the roll to the next number, as you thus simply lose a film but preserve both negatives; if, on the other hand, you make a double exposure, you will lose both pictures.

The snapshot photographer should never take a picture unless he really wants it and unless he is pretty certain of making a picture. Snapping here and there without a proper condition of light, focus, or subject is a very bad habit to contract. Until

you can make at least eight good pictures out of ten you are not a photographer. No average lower than this should satisfy you. Do not blame the lens for your failures. In recent years the art of making lenses has advanced wonderfully, and while the one in your camera may not be an expensive one or capable of a wide range of use, it is at least adapted to the purpose of your instrument or you may be sure that the manufacturers would never have used it.

We should not consider the snapshot expert who merely presses the button as a real photographer, even though he obtains fine pictures. No one deserves this name who does not understand the operations of the dark room. One who has experienced the wonderful sensation of working in a faint yellow-ruby light and by the application of certain mysterious chemicals of seeing a picture gradually come into view on the creamy surface of a dry plate will never again be satisfied to push the button and allow some one else "to do the rest." However, if you do not wish to go into photography extensively you may at least learn just what limits your hand camera has, and at the end of the season in place of a lot of ill-timed pictures you can have an album full of creditable prints for which no apology will be necessary.

It is quite beyond the limits of this chapter to go into photography fully, but some of the simple principles may be of use to the boy or girl who has taken up the subject. The modern snapshot camera even of small size has great possibilities. With a clear negative we can have an enlargement made on bromide paper that will be a source of great satisfaction. The actual making of enlargements is usually beyond the limits of an amateur's outfit. In this part of photographic work it will be better to patronize a professional.

To become an expert photographer and one whose work will be worth while, we must really make a study of the subject. The modern outfits and chemicals make it very easy for us if we do our part.

The basis of successful work is a good lens, which is really the eye of the camera. In selecting it we should get just as good a one as we can afford. There are a great many excellent makes of lenses on the market and even the stock types that are supplied with moderate-priced cameras are of very good quality. The two distinct types of lenses are the "rapid rectilinear" and the "anastigmatic," which names refer to their optical properties in distributing the light. For our purpose all we need to know is

that the higher price we pay the better our lenses will be, and in addition to this the further fact that the best kind of results can be obtained by any lens provided that we do not try to force it to do work for which it is not adapted.

To understand photography we must first of all get a clear notion of the use and purpose of the stops, as the various openings or apertures are called that the lens is provided with. A "fast" lens is one that will give a sharp picture at a maximum opening, and such lenses are both the most expensive and the most universal in their application. Lenses of this class are used in making instantaneous pictures with very rapid exposures, and for ordinary view or portrait work will produce no better results than much slower and less expensive types.

Perhaps the best way to understand photography as an art rather than a "push the button" pastime is to take up the process of making a picture step by step. To begin with, the real photographer will use plates instead of films, as much better pictures usually are possible by their use. Dry plates come a dozen in a box, usually packed face to face—that is, with the film or sensitive sides facing. The plate-holder must be loaded in a dark room or dark closet, with absolutely no exposure to daylight

or any artificial light whatever except a very faint light from a dark-room lantern, a combination of ruby and yellow glass or paper. We should always test our dark room and light by means of a plate before we trust them to actual working conditions. Take a fresh plate and cover it half with a piece of cardboard, or if it is in a holder draw the slide half way out and allow the dark-room light to strike it for five minutes, then develop the plate just as you would an exposed negative, and if the test plate shows the effect of the exposure and darkens, we shall need to make our light safer either by adding a sheet or two of yellow or ruby paper or we must examine our room carefully to stop up any cracks where rays of white light may enter. We must remember that a plate sensitive enough to record instantaneous exposures of 1-500 of a second must be sensitive to any tiny ray of outside light also. Almost any room will make a dark room, especially if it is used at night. By drawing the shades and by doing our work in a far corner of the room away from outside light we are comparatively safe. Of course an electric street lamp or other bright light would have to be shut out, but this can easily be done by pinning up a blanket over the window.

When we have loaded our plate-holders we are

ready to make a picture. Suppose, for example, it is to be a house or a vista of some kind such as a group of trees or a bit of water: the first thing of importance is to obtain a point of view that will not only give us the picture we desire but that will leave out any undesirable features that we do not care to take. Some cameras are provided with a small view finder for snapshot work, and this may often be used to get a general idea of what the picture will be.

Successful photography consists largely in knowing just what to take and what to omit. Sometimes an ugly piece of fence or a post will spoil an otherwise excellent picture. We must also remember that in a photograph our colours are expressed in black and white, and therefore a picture that depends on its colour contrast for its beauty, such as autumn foliage or a sunset, may be disappointing as a photograph.

When we have decided upon our subject, the next step is to set our camera in the proper position to permit the plate to take in what we wish. Usually it will be necessary to shift our position several times until we find the proper position. The tripod should be firmly set on the ground and the camera made as level as possible. The camera should then be

focussed with the stop or diaphragm wide open. The fact that the image is inverted as it appears on the ground glass will at first be confusing to a beginner, but we soon become accustomed to it and never give it a thought. Our focussing cloth should be tightly drawn about the head to keep out as much outside light as possible. At first we have some difficulty in seeing the image on the ground glass, but after we learn to look at the glass and not through it we should have no further trouble in this respect. By moving the lens backward and forward we finally strike a position where the principal image to be photographed will appear sharp and clear. The camera is then in focus, but we shall discover that other objects more in the background or foreground will appear blurred and confused. Often it is desirable to have a blurred or "fuzzy" background, but if we desire to bring the indistinct objects in focus we must "stop down" our lens first by trying the No. 8 stop, and if this does not accomplish the results the No. 16, and so on until we get what we wish. As we look at the image on the ground glass, it will be evident that as we stop down our lens, the more remote objects are gradually brought into view with a sharp outline, we shall discover that the image on the ground glass becomes

less and less distinct, which shows very clearly that we are admitting less light, and the lesson to be learned is that when we make the exposure we must give a corresponding increase in time as the amount of light admitted decreases. An exposure that would give a perfect picture at No. 8 may be very much under-exposed at No. 32 diaphragm.

Having focussed our camera and set the stop, we then close the shutter, insert the plate-holder in the back of the camera and carefully draw the slide. Omitting to pull the slide is a common mistake with beginners. We are now ready to decide just what exposure to give our plate. Rules for exposure are almost useless, but in general it may be said that the modern plates are lightning fast and that in bright sunlight at midday the average exposures will not be over 1-25 of a second. An "exposure meter" will prove to be of great assistance to a beginner, but such arrangements are not often used by experts except in doubtful cases. We soon find that we can guess at average exposures with considerable accuracy, especially if we adopt a certain brand of plate and become accustomed to its working qualities. Of course all of these speeds must be indicated on the shutter, and all we can do is to set our shutter at this point and squeeze the

bulb. Correct judgment in exposure will only come after experience. In taking interior views or making pictures on dark days we shall be less likely to make a mistake than in bright sunlight. I have made two interior views, to one of which I gave ten minutes and the other an hour, with practically the same result in the negative. An over-exposed plate is flat, which means that the print will lack contrast and be unsatisfactory as a photograph.

After the bulb is squeezed and the exposure made we are ready to develop our plate and to see what result we have obtained. Of course in practice we make a number of exposures before we begin to develop. Some photographers use numbered plate-holders and keep a record of the pictures, time of day and of exposure, stop and any other items of interest. We now take the plate-holder in our dark room and prepare our developer. There are a great many developers on the market and we can scarcely make a mistake with any of them. Probably the best of all is "pyro," but the fact that it stains the fingers is a serious objection to it for amateur use, and almost any other developer, such as metol, eikonogen or hydroquinon will be better.

These stock developers usually come in dry salts,

which must be dissolved and mixed. All of this work must be done in the light so we can see that we are getting the proper proportions and that the chemicals are thoroughly in solution. The developing trays should be washed thoroughly and placed conveniently at hand so that we can find them in the dark. In addition to developers we must have what is called the "hypo" fixing bath. This is a solution of hyposulphite of soda, a chemical which is used in development and which renders the plate no longer sensitive to light, but dissolves that part which has not been acted upon by the developer. The hypo should be in a tray or box placed conveniently at hand but not so located that it will be liable to become mixed with the developer or in any way to splash or spot the plate. We must always wash the hands thoroughly after immersing a plate in the hypo before handling a fresh plate, as a very few drops will ruin a negative.

After we have prepared the hypo and the developer we are ready to develop the plate. Place it face side up in the tray and quickly pour the developer over it, being sure that the solution covers the surface immediately, to avoid unequal development. While we should not develop in a strong red or yellow light we can at least place our tray in

such a position that we may watch the process of bringing up the image out of the creamy surface of the plate. This is the most fascinating part of photography. First the high lights will appear and then the shadows, and then after an instant the whole image will come into view and then begin to fade away. To know at what point development should stop will only come by experience with negatives of all sorts of classes. Generally speaking, when the image fades from view and begins to appear through the film on the glass side we should wash it quickly and immerse it in the hypo. The "fixing" in hypo will take probably five minutes and should be continued until the white coating is thoroughly dissolved. The plate may then be brought safely to the light and should be washed thoroughly either in running water for half an hour or in at least twelve changes of fresh water. Care must be taken not to touch the film side of the plate during development or fixing, as the gelatine coating becomes very soft and will show the slightest scratch or abrasion. We must dry the plate away from dust, sunlight, or artificial heat. After it is dry we are ready to make a print.

Photographic printing papers are of two classes — those which are used in direct sunlight and upon

which the image gradually appears, and those which are similar to plates and which are given a very short time exposure in artificial light and the picture developed just as we should a plate. The beginner will probably have more uniform success with sunlight paper after the simple process of toning and fixing is learned, although the developing papers are extremely simple to handle and give better results.

The final step of trimming and mounting the print is too simple to require explanation.

There are a great many things that might be said about photography, but in a book of this kind only the most simple facts are stated. If you become a photographer you will soon learn many of the fine points.

Our negatives should all be kept carefully in labelled envelopes and a record kept in a book of some kind.

When we really become expert as a photographer, there are many opportunities to make our hobby pay. The publishers of nearly all the magazines experience the greatest difficulty in securing the kind of pictures they wish to reproduce. This is remarkable when so many people are taking pictures. If one wishes to sell pictures, it is im-

portant to study the class of materials that the magazines use. Then, if we can secure good results, we can be almost sure of disposing of some of our work and, in addition to the money, have the satisfaction of seeing our pictures published.

XIX

OUTDOOR SPORTS FOR GIRLS

What to wear — Confidence — Horseback riding — Tennis — Golf—Camping

A GENERATION ago the girl who joined her brother in his sports would have been considered a "tom boy," but in recent years girls have discovered that with comparatively few exceptions they can join in the sports and recreations of their brothers and in some cases attain a remarkable degree of skill.

Girls' schools have done much to spread this idea. A rational outdoor costume and a desire to be physically well also has helped "the outdoor girl" to be regarded as the highest type of womanhood. Only her grandmother sighs over tanned cheeks and muscular arms.

The girl who is not a good sport is the exception rather than the rule. Besides, our grandmothers worked at their gardening, which is out-of-door exercise, and a preventive, as Kipling tells, of the

"hump" we get from having too little to do. He says:

> "*The cure for this ill is not to sit still,*
> *Or frowst with a book by the fire,*
> *But to take a large hoe and a shovel also,*
> *And dig till you gently perspire.*"

From a feminine standpoint the first question must be, "What shall I wear?" There is no need to be handicapped by skirts, at least when one's exercise is taken in company with a crowd of girls. The bicycle introduced the bloomer girl and this costume is now generally regarded as proper for outdoor girls. In camp one should in addition wear a sailor blouse, and a pair of sneakers, which though rather heating for the feet are very comfortable and very satisfactory for long tramps through the woods. The rubber soles give a firm footing on slippery moss and dead leaves, while high heels might cause a wrenched ankle or a bad fall. It is perfectly allowable for a girl to wear a broad-brimmed hat to avoid sunburn, which might be so serious as to spoil a vacation. A gradually acquired coat of tan is much more desirable. The hat prevents headaches or sunstroke, neither of which may be dared with impunity by a delicate girl, unless she wears her hair on top of her head.

In regard to hair, which is of great importance to its owner, though very much of a nuisance after the age when it may be worn boyishly short, the one word is that it must be fixed to stay without repinning or tucking back at frequent intervals. For bathing, a girl must either be willing to have her hair well soaked or else to put a cap on so tightly that it cannot be loosened. To hesitate to try a dive for fear of getting wet hair spoils much of the sport of swimming. Each moment of hesitation makes her more convinced that perhaps, after all, she had better not try that dive, because she probably would not be able to do it anyway. The lack of confidence is disastrous. I have known girls who could swim perfectly well in the shallows but could not keep up at all in water out of their depth. And yet they have not been touching the bottom in the shallow water, but they *could* if they wished. Learning to swim in water that is over your head is really better, though it is more "scary" at first. If you do learn in that way you can thereafter look upon the deepest water with confident scorn.

Confidence is a necessary possession for the beginner in almost any sport. It is so much easier to do anything if we are quite positive that we can.

Probably, because you are a girl and are modest, you will have to assume this attitude, but in horseback riding, for example, an instant of fear while on the horse's back will "give you away" to the beast. Since he is as keen as a dog to know when you fear and dislike him, he will undoubtedly take advantage of it. If you are quite positive that you can learn to ride and that the horse under you is harmless, you will keep a firm hold on the reins instead of clinging to the saddle horn in a panic.

The trying part of learning to ride is that the first day's experience is painfully stiffening. This applies to almost any unusual exercise. But to withdraw on account of that you may as well resign yourself to taking exercise no more severe than that afforded by a rocking chair. It does not pay to stop when you are stiff. Sticking to it is the only way that will train those hitherto unused muscles to perform their duties with no creaking of the hinges. A good night's rest is the utmost limit of time that should intervene between each trial.

A girl has the physical disadvantage of less endurance than a boy, and she does have to care for herself in that respect, and leave untried some forms of exercise that would be overexertion for her. A girl may "paddle her own canoe," of course,

without risk of overstraining herself, but when it comes to moving it from place to place out of the water, the feather-light canoe of poetry becomes heavy reality. Two girls can carry a canoe between them for a short distance without much difficulty, but if one is alone it is far better to drag the canoe over the ground, which is not particularly hard on it, unless the ground is rough. The boy's way of carrying it balanced upside down on his shoulders requires considerable strength.

Devotees of tennis will claim first place for that among girls' sports. The amount of practice and quickness of thought and motion that may be acquired in a game of tennis is remarkable; the fascination of the game itself rather than the benefits to be derived from it will hold the attention. The main trouble is in the learning, which requires unflagging energy and constant practice. An overmodest beginner will make the mistake of playing only against her likewise beginning friends; the result is that she takes a discouragingly long time finding out how to use her racket properly and never gets a chance to return a really good serve.

It is really just as well at some point in your practising to see some well-trained athlete do the thing you are trying to learn.

A girl can accomplish a great deal with her brain as well as with her muscles in athletics. Some one once remarked that he learned to swim in winter and to skate in summer. He meant that after he had in its proper season practised skill in the winter sport, his brain, during the warm months, kept repeating to the muscles those directions until by the next winter they had a very fair idea of what they had to do, and responded more quickly and easily. It is rather consoling to think you do not lose time, but rather progress, between seasons.

The girl who goes camping with a crowd of boys and girls realizes how much depends on the mere strength of the boys; at the same time she herself has an opportunity of showing not only her athletic proficiency and nerve, but also her superior common sense. She will really have to leave the heavy work of pitching the tents and chopping the wood to the boys, but she cannot sit down and fold her hands meanwhile. She can be collecting materials for the beds of balsam on which they hope to sleep in comfort, or she may gather chips for the fire, or she may be helping to unload the wagon or canoes in which they have come. When the tents are pitched she has a woman's prerogative of "putting the house in order," and during the time of camping keeping it so.

If there is actually a case of nothing for her to do, far better for her to sit down and keep quiet than to get in the way of the boys and bother them. A young man who in his first season as a guide in the Canadian woods took out a party of girls from a summer school on a camping trip told me that he would never do it again, because they gave him no relief from a continual rain of questions. A case where zeal for knowledge outruns discretion.

After the tents are pitched and the fire made by the boys, it is plainly up to the girls to get supper. Let us hope they have practised cooking for some time before they went camping. Every one gets so desperately hungry in the outdoor life that meals are of first importance, as tempers are apt to develop unexpectedly if many failures are turned out. If the girls are good cooks, however, and wash the dishes after each meal the division of labour will be fair to all concerned.

A girl is more or less dependent on her boy friends for instruction in sports and considerably anxious for their approval. Even if she has a woman instructor, in nine cases out of ten she requires some kind of praise from some man before she is satisfied with her performance. Sister may tell her that she steers her canoe with beautiful precision, but unless brother

remarks carelessly that "the kid paddles pretty well" she will hesitate to take her canoe in places where expert paddling is required. When you know that you can do some things as well as any boy you still have to rest content with the grudging assurance that "you do pretty well for a girl."

XX

ONE HUNDRED OUTDOOR GAMES

The following games are described in this chapter:

All-around Athletic Championship
Archery
Association Football
Badminton
Balli-callie
Bandy
Baseball
Basket Ball
Bean Bag
Best College Athletic Records
Blind Man's Buff
Boulder On
Bull in the Ring
Call Ball
Cane Rush
Canoe Tilting
Cat, or Cattie
Counting-out Rhymes
Court Tennis
Cricket
Croquet
Curling
Dixie's Land
Duck on the Rock
Equestrian Polo
Fat
Feather Race
Foot-and-a-half
Football
Garden Hockey
Golf
Golf-Croquet
Hab-Enihan
Haley Over
Hand Ball
Hand Polo
Hand Tennis
Hat Ball
Hide and Seek
High Kick
Hockey
Hop Over
Hop Scotch
Hunkety
Hunt the Sheep
Intercollegiate Amateur Athletic Association of America

I Spy
Jack Fagots
Jai-A-Li
Japanese Fan Ball
Kick the Stick
King of the Castle
Knuckle There
Lacrosse
Lawn Bowls
Lawn Bowling
Lawn Hockey
Lawn Skittles
Lawn Tennis
Last Tag
Luge-ing
Marathon Race
Marbles
Mumblety Peg
Names of Marbles
Nigger Baby
Olympic Games
One Old Cat
Over the Barn
Pass It
Pelota
Plug in the Ring
Polo
Potato Race
Prisoner's Base
Push Ball
Quoits
Racquets or Rackets
Red Line
Red Lion
Roley Boley
Roque
Rowing Record
Rubicon
Sack Racing
Scotland's Burning
Skiing
Soccer
Spanish Fly
Squash
Stump Master
Suckers
Tether Ball
Tether Tennis
Three-Legged Racing
Tub Racing
Volley Ball
Warning
Washington Polo
Water
Water Race
Wicket Polo
Wolf and Sheep
Wood Tag
Yank

While all the games and sports described in this chapter are not absolutely confined to outdoors, almost any game in which violent physical exercise

results is better if played in the open air rather than in a house or gymnasium. In fact, we should only play indoors when the weather makes it impossible for us to be outside.

There are very few indoor games that cannot be played in the open air with proper apparatus or rules. It is also equally true that many of our outside sports may be played indoors with certain modifications.

ALL-AROUND ATHLETIC CHAMPIONSHIP

This contest was instituted in America in 1884 to give athletes an opportunity to demonstrate their ability in all-around work. The contest is rapidly becoming the blue ribbon championship event in America for track athletes. The following ten events are contested for:

100-yard dash	Putting 16-pound shot
High jump	Throwing 56-pound weight
Long jump	120-yard hurdle race
Vault	Half-mile walk
Throwing 16-pound hammer	One-mile run

The system of scoring in the All-around Championship is complicated. Each contestant has his score made up independently. The world's best amateur record is taken as a basis and 1,000 points

are allowed for it. For example, the best record (amateur) for the 100-yard dash is $9\frac{4}{5}$ seconds and for each $\frac{1}{5}$ of a second more than this that the runner in the All-around Championship contest makes in his trial 42 points are deducted from this score. The same method is used in all the events. In the ten events the maximum score where the contestant equalled every world's record would be 10,000 points. The contest was won in 1909 by the remarkable score of 7,385 points.

ARCHERY

Archery is the art of shooting with a bow and arrow. It is especially adapted as a lawn game for ladies and gentlemen, but boys and girls can practise archery and become proficient with bows and arrows just as the Indians were or the boys in England in the days of Robin Hood. Of course the invention of gunpowder has practically done away with the bow and arrow either as a means of warfare or as a weapon to be used in the chase, but it is still used by savages.

The modern bow used in archery is made of lancewood or yew and for men's use is usually 6 feet long and for women and children 6 inches shorter. The

strength or pull necessary to bend the bow, given in pounds, determines its classification. The arrows for men's use should be 28 inches long and for women 24 to 25 inches. The target is a straw-filled canvas disk painted in bright colours. There are usually five circles and the object in archery, as in shooting with firearms, is to hit either the centre ring or "bull's-eye" or as near to it as possible. In scoring, a shot in the inner gold centre counts nine; red ring, seven; inner white ring, five; black ring, three, and outer white ring, one. Targets are of various sizes from 18 inches in diameter to 4 feet, depending on the distance of the range. A common distance will be from 50 to 100 yards.

Each archer should have some distinguishing mark or colour on his arrows. Standard lancewood bows will cost two or three dollars, arrows from one to two dollars a dozen, and targets from two to five dollars each, with three dollars extra for the target stand.

In championship matches in archery the customary range for men is 60 yards with 96 arrows, and the same number of arrows at 50 yards for women. A recent match championship was decided for men with 90 hits and a total score of 458,

and for women with 85 hits and a total score of 441.

ASSOCIATION FOOTBALL OR SOCCER

A game similar to Rugby football except that it more closely resembles what its name implies and kicking predominates. A round, leather-covered ball is used and the game is considered to be much safer than our college football. Efforts consequently have been made to introduce the game into American colleges because of its less dangerous character. As there is practically no tackling or falling, the "soccer" uniform does not require the same amount of padding as a Rugby player's uniform. The game is ordinarily played in running trousers with a full sleeved shirt and special shoes with leather pegs or cleats. The stockings are rolled down just below the knee. The association football goal net into which the ball is kicked is fastened to the ground and is made of tarred rope. Thus far, the game has not been very popular in America, although a number of exhibition match games have recently been played by visiting English teams which attracted considerable attention. As a game, soccer is fast and exciting, and splendid opportunities are given for team work; but for some reason

it has not succeeded in displacing our American game of Rugby, although possibly it is more interesting for the spectator.

BADMINTON

An English outdoor game similar to lawn tennis but played with shuttlecocks. The net is five feet above the ground. The shuttlecock is a cork in which feathers have been inserted. The shuttlecock is served and returned as in tennis and either two or four may play. A badminton court is 30 feet wide and 44 feet long.

BANDY

A game very similar to hockey, except that it is played out of doors instead of in a covered rink and a ball is used in place of a puck or rubber disk.

The name "bandy" is sometimes applied also to shinney or shinty and in England it is also applied to our American game of ice hockey.

BASEBALL

The national game of America. (See chapter on baseball.) The game is played by eighteen persons, nine on a side, called "nines." The positions are pitcher, catcher, first base, second base, third base, shortstop, right-field, left-field, centre-field. The

first six positions are called the in-field, and the last three, the out-field. The diamond or field where the game is played is a square plot of ground with sides ninety feet long. At each corner of the square are bases called first, second, third and home plate. A game consists of nine innings, in each of which both teams have an opportunity to bat the ball and to score runs. The players bat in turn and attempt to reach the various bases without being put out by their opponents. Each year the rules are changed in some slight particulars, consequently a beginner in baseball must be thoroughly familiar with the rules of the game before attempting to play. The pitcher attempts to pitch the ball over the home plate to the catcher and the batsman endeavours to hit it. If the ball after being hit is caught by one of the opposing players, or if it is thrown to the base to which the batsman is running before he reaches the base, he is "out." Otherwise he is "safe" and will try to make the next base. If he completes the circuit of the four bases without being put out, he scores a run for his team or nine. When a player makes the entire circuit without being forced to stop for safety he makes a "home run." A hit which gains him a single base only is called a "base hit." Similarly if he reaches second base

it is a "two-bagger," and third base, a "three-bagger."

After three players are put out, the other side has its "innings," and at the completion of nine full innings the side having scored the greatest number of runs is the winner. The game of baseball has become very scientific and the salaries of professional players are almost as high as those of the highest salaried men in business life.

The ball used in the game is made of the best all wool yarn with a horsehide cover and a rubber centre. Baseball bats are usually made of ash.

BASKET BALL

A game of ball which may be played either in-doors or out, but which is especially adapted to in-door play when weather conditions make out-door sports impossible. Two baskets suspended on wire rings are placed at the two opposite ends of a room or gymnasium and the players strive to knock or pass the ball from one to another on their own side and to throw it so that it will fall into the basket. It is not permissible to run with the ball as in Rugby football. The ball used is round, but in other respects resembles the ball used in football. It is made in four sections of grained English leather

and is inflated by means of a rubber bladder. The players use rubber-soled shoes with peculiar knobs, ridges, or depressions to prevent slipping. The conventional uniform is simply a gymnasium shirt, running trousers, and stockings which are rolled down just below the knees.

The game of basket ball is especially adapted to women and girls and consequently it is played very largely in girls' schools and colleges.

Any level space may be used for basket ball. A convenient size is 40 by 60 feet. The baskets used for goals are 18 inches in diameter and are fixed 10 feet above the ground or floor. The official ball weighs about 18 ounces and is 31 inches in circumference. Five players constitute a team. The halves are usually twenty minutes, with a ten-minute intermission for rest.

It is not permissible to kick, carry or hold the ball. Violation of a rule constitutes a foul and gives the opponents a free throw for the basket from a point fifteen feet away. A goal made in play counts two points and a goal from a foul one point.

BEAN BAGS

This game is known to every one by name and yet its simple rules are often forgotten. A couple

of dozen bean bags are made in two colours of muslin. The players stand in two lines opposite each other and evenly divided. At the end of the line is a clothes basket. The bags are placed on two chairs at the opposite end of the line and next to the two captains. At a signal the captains select a bag and pass it to the next player, who passes it along until finally it is dropped into the basket. When all the bags are passed they are then taken out and passed rapidly back to the starting point. The side whose bags have gone up and down the line first scores a point. If a bag is dropped in transit it must be passed back to the captain, who starts it again. Five points usually constitute a game.

BEST COLLEGE ATHLETIC RECORDS

These records have been made in the Intercollegiate contests which are held annually under the Intercollegiate Amateur Athletic Association of America.

100-yard dash	9⅘ seconds	made in 1896
220-yard dash	21⅕ seconds	made in 1896
440-yard dash	48⅘ seconds	made in 1907
Half-mile run	1 min. 56 seconds	made in 1905
One-mile run	4 min. 17⅘ seconds	made in 1909
Two-mile run	9 min. 27⅗ seconds	made in 1909
Running broad jump	24 feet 4½ in.	made in 1899

Running high jump	6 feet 3¼ in.	made in 1907
Putting 16-pound shot	46 feet 5½ in.	made in 1907
Throwing the hammer	164 feet 10 in.	made in 1902
Pole vault	12 feet 3¼ in.	made in 1909
120-yard high hurdle	15⅕ seconds	made in 1908
220-yard hurdle	23⅗ seconds	made in 1898
One-mile walk	6 min. 45⅖ seconds	made in 1898

BLIND MAN'S BUFF

This game is played in two ways. In each case one player is blindfolded and attempts to catch one of the others and to identify him by feeling. In regular blind man's buff, the players are allowed to run about at will and sometimes the game is dangerous to the one blindfolded, but in the game of "Still Pon" the one who is "it" is turned several times and then announces, "Still Pon no more moving," and awards a certain number of steps, which may be taken when in danger of capture. After this number is exhausted the player must stand perfectly still even though he is caught.

BULL IN THE RING

In this game the players form a circle with clasped hands. To be "bull" is the position of honour. The bull is supposed to be locked in by various locks of brass, iron, lead, steel, and so on. He endeavours to break through the ring by catching some of the players off their guard. He will then run

until captured, and the one who catches him has the position of bull for the next game. In playing, it is customary for the bull to engage one pair of players in conversation by asking some question such as "What is your lock made of?" At the answer, brass, lead, etc., he will then make a sudden rush at some other part of the ring and try to break through.

CALL BALL

In this game a rubber ball is used. One of the players throws it against a wall and as it strikes calls out the name of another player, who must catch it on its first bounce. If he does so he in turn then throws the ball against the wall, but if he misses he recovers it as quickly as possible while the rest scatter, and calls "stand," at which signal all the players must stop. He then throws it at whoever he pleases. If he misses he must place himself against the wall and each of the others in turn has a free shot at him with the ball.

CANE RUSH

This contest is usually held in colleges between the rival freshman and sophomore classes. A cane is held by some non-contestant and the two classes

endeavour by pulling and pushing and hauling to reach the cane and to hold their hands on it. At the end of a stated time, the class or side having the most hands on the cane is declared the winner. It is a very rough and sometimes dangerous game and in many colleges has been abolished on account of serious injuries resulting to some of the contestants.

CANOE TILTING

This is a revival of the ancient game of tilting as described in "Ivanhoe," except that the tilters use canoes instead of horses and blunt sticks in place of spears and lances. The object is for the tilter to shove his opponent out of his canoe, meanwhile seeing to it that the same undesirable fate does not fall to his own lot. In singles each contestant paddles his own canoe with one end of his pike pole, but the sport is much greater if each canoe has two occupants, one to paddle and the other to do the "tilting."

CAT

A small block of wood pointed at both ends is used in this game. The batter strikes it with a light stick and as it flies into the air attempts to

bat it with the stick. If the cat is caught the batter is out. Otherwise he is entitled to a score equal to the number of jumps it will take him to reach the place where the cat has fallen. He then returns to bat again and continues until he is caught out.

COUNTING-OUT RHYMES

Almost every section has some favourite counting-out rhyme of its own. Probably the two most generally used are:

"*My mother told me to take this one,*"

and that old classic —

"*Eeny, meeny, miny, mo.*
Catch a nigger by the toe;
If he hollers, let him go.
Eeny, meeny, miny, mo."

This is also varied into

"*Ena, mena, mona, mite.*
Pasca, laura, bona, bite.
Eggs, butter, cheese, bread.
Stick, stock, stone dead."

The object of a counting-out rhyme is to determine who is to be "it" for a game. As each word is pronounced by the counter some one is pointed at,

and at the end of the verse the one last pointed at is "it."

COURT TENNIS

This game, though very similar to rackets and squash, is more scientific than either. The court is enclosed by four walls. A net midway down the court divides the "service" side from the "hazard" side. The rackets used in court tennis have long handles and a large face. The balls used are the same size as tennis balls, but are heavier and stronger. In play, the ball rebounds over the court and many shots are made against the roof. While somewhat similar to lawn tennis, the rules of court tennis are extremely complicated. The game is scored just as in lawn tennis, except that instead of calling the server's score first the marker always announces the score of the winner of the last stroke.

CRICKET

A game of ball which is generally played in England and the British provinces, but which is not very popular in the United States. There are two opposite sides or sets of players of eleven men each. At two points 22 yards apart are placed two wickets 27 inches high and consisting

of three sticks called stumps. As in baseball, one side takes the field and the other side is at the bat. Two men are at bat at a time and it is their object to prevent the balls from being bowled so that they will strike the wickets. To do this a broad bat is used made of willow with a cane handle, through which are inserted strips of rubber to give greater spring and driving power. The batsman will either merely stop the ball with his bat or will attempt to drive it. When the ball is being fielded the two batsmen exchange wickets, and each exchange is counted as a run, and is marked to the credit of the batsman or striker. The batsman is allowed to bat until he is out. This occurs when the ball strikes the wicket and carries away either a bail, the top piece, or a stump, one of the three sticks. He is also out if he knocks down any part of his own wicket or allows the ball to do it while he is running, or if he interferes with the ball by any part of his person as it is being thrown, or if one of the opposing players catches a batted ball before it touches the ground, as in baseball.

When ten of the eleven men on a side have been put out it constitutes an inning, and the side in the field takes its turn at the bat. The game usually

consists of two innings, and at its completion the side having scored the greater number of runs is the winner. The eleven positions on a cricket team are called bowler, wicket-keeper, long stop, slip, point cover-slip, cover-point, mid-off, long-leg, square-leg, mid-on. The one at bat is, as in baseball, called the batsman. The two lines between which the batsmen stand while batting are called "popping creases" and "bowling creases."

CROQUET

A game played with wooden balls and mallets, on a flat piece of ground. The game consists in driving the ball around a circuitous course through various wire rings called "wickets" and, after striking a wooden peg or post, returning to the starting place. Any number may play croquet either independently or on sides. Each player may continue making shots as long as he either goes through a wicket, hits the peg or post, or hits the ball of an opponent. In this latter case he may place his ball against that of his opponent and, holding the former with his foot, drive his opponent's ball as far as possible from the croquet ground. He then also has another shot at his wicket.

A croquet set consists of mallets, balls, wickets, and stakes and may be bought for two or three dollars. Experts use mallets with much shorter handles than those in common sets. They are made of either maple, dogwood, or persimmon. In place of wooden balls, championship and expert games are often played with balls made of a patented composition. All croquet implements are usually painted in bright colours. The game of "roque" is very similar to croquet.

Croquet can be made more difficult by using narrow arches or wickets. Hard rubber balls are more satisfactory than wood and also much more expensive.

As a rule the colours played in order are red, white, blue and black. According to the rules any kind of a mallet may be used, depending upon the individual preference of the player.

CURLING

An ancient Scotch game played on the ice, in which the contestants slide large flat stones, called curling stones, from one point to another. These points or marks are called "tees." In playing, an opportunity for skill is shown in knocking an opponent out of the way, and also in using a

broom ahead of the stone as it slides along to influence its rate of speed.

At the present time the greatest curling country is Canada. Curling is one of the few outdoor games that are played without a ball of some kind.

DIXIE'S LAND

This game is also called "Tommy Tiddler's Land." It is a game of tag in which a certain portion of the playground is marked off as the "land." The one who is "it" endeavours to catch the others as they invade his land. When a player is tagged he also becomes "it," and so on until the game ends because all the invaders are captured. The game is especially interesting because of the variety of verses and rhymes used in various parts of the country to taunt the one who is "it" as they come on his land.

DUCK ON A ROCK

This game is also called "Boulder Up." It is not customary to "count out" to decide it. For this game usually some one suggests, "Let's play Duck on a Rock," and then every one scurries around to find an appropriate stone, or "duck." As fast as they are found the fact is announced by

the cry, "My one duck," "My two duck," etc. The last boy to find a stone is "drake," or "it."

The drake is larger than the ducks and is placed on an elevated position such as a boulder. Then from a specified distance ducks attempt to hit the drake and to knock him from his position. If they miss they are in danger of being tagged by the drake, as it is his privilege to tag any player who is not in possession of his duck. If, however, the drake is knocked from his perch, the ducks have the privilege of rushing in and recovering their stones, but unless they do so before the drake replaces his stone on the rock they may be tagged. The first one tagged becomes "it" and the drake becomes a duck.

FAT

This is the universal game of marbles. It is sometimes called "Yank," or "Knuckle There." A ring is scratched in the ground a foot or two in diameter. It is then divided into four parts by two lines drawn through the diameter. The first step is for each player to "lay a duck," which in simple language means to enter a marble to be played for. This is his entrance fee and may be either a "dub," an "alley," a "crystal," or sometimes a

"real," although this is very rare as well as extravagant. About ten feet from this ring a line is made called a "taw line." The first player, usually determined as soon as school is out by his having shouted, "First shot, fat!" stands behind the taw line and shoots to knock out a marble. If he is successful he continues shooting; if not he loses his turn and Number 2 shoots. Number 1 after his first shot from the taw line must then shoot from wherever his marble lies. If Number 2 can hit Number 1 he has a right to claim all the marbles that Number 1 has knocked out of the ring. In this way it is very much to the advantage of each player to leave himself as far from the taw line as possible.

FEATHER RACE

The contestants endeavour to blow a feather over a certain course in the shortest time. The rule is that the feather must not be touched with the hands. Out of doors this game is only possible on a very still day.

FOOT AND A HALF

This is a game of "Leap Frog" also called "Par" or "Paw." One of the boys is chosen "down," who leans over and gives a "back" to the rest, who

follow leader, usually the boy who suggests the game. He will start making an easy jump at first and over "down's" back, then gradually increase the distance of the point at which he lands, and each of those following must clear this line or become "it" themselves. The leader must also surpass his previous jumps each time or he becomes "down" himself. In this way the smaller or less agile boys have a more equal chance with the stronger ones.

FOOTBALL

The present game of football as played in American schools and colleges is a development of the English game of Rugby. There are twenty-two players, eleven on a side or team. The game is played on a level field, at each end of which are goal posts through which the team having the ball in its possession attempts to force or "rush" it, while their opponents by various means, such as tackling, shoving or blocking, strive to prevent the ball from being successfully forced behind the goal line or from being kicked over the crossbar between the goal-posts. A football field is 330 feet long by 160 feet wide. It is usually marked out with white lines five yards apart, which gives the field the name of "gridiron." The various positions on a football

team are centre rush, right and left guards, right and left tackles, right and left ends, quarter-back, right and left half-back, and full-back. As in baseball, the rules of football are constantly being changed and the game as played ten or fifteen years ago is very different from the modern game. The various changes in rules have been made with a view to making the game less dangerous to the players and more interesting to the spectator.

The principal scores in football are the "touchdown" and the "field goal." In a touchdown the ball is carried by one of the players and touched on the ground behind the opponents' goal line. In a field goal, or, as it is often called, "a goal from the field," the ball is kicked over the crossbar between the goal posts. In a field goal the player executing it must not kick the ball until after it has touched the ground. Such a kick is called a "drop kick" as distinguished from a "punt" where the ball is released from the hands and immediately kicked before touching the ground. A team in possession of the ball is allowed a certain number of attempts to advance it the required distance. Each of these attempts is called a "down." If they fail to gain the necessary distance, the ball goes to their opponents. It is customary on the last attempt, or

down, to kick the ball so that when the opposing team obtains possession of it it will be as far as possible from the goal line toward which they are rushing. In this play a "punt" is allowed. There are also other scores. A safety is made when a team is forced to touch the ball down behind its own goal line.

The ball used in American football is a long oval case made of leather and inflated by means of a rubber bag or envelope. The football player's uniform consists of a heavily padded pair of trousers made of canvas, moleskin, khaki or other material, a jacket made of the same material, a tight-fitting jersey with elbow and shoulder pads, heavy stockings, and cleated shoes. Players will often use other pads, braces and guards to protect them from injury. Football is usually played in the fall months after baseball has been discontinued on account of the cold weather. A full game consists of four fifteen-minute periods.

GARDEN HOCKEY

This game is played between two parallel straight lines, 3 feet 6 inches apart and marked on the lawn with two strips of tape. At the opposite two ends of the tape are two goal posts 14 inches apart with

a crossbar. The length of the tapes should be 36 feet when two or four players engage in the game, and may be extended for a greater number. The game is played with balls and hockey sticks. The game is started by placing the ball in the centre of the field. The two captains then face each other and at a signal strike off. If the ball is driven outside the tape boundaries it must be returned to the centre of the field opposite the place where it crossed the line. The object of the game is to score a goal through your opponents' goal posts as in ice hockey. If a player steps over the tape into the playing space he commits a foul. The penalty for a foul is a free hit for his opponents.

GOLF

A game played over an extensive piece of ground which is divided into certain arbitrary divisions called holes. A golf course is usually undulating with the holes laid out to afford the greatest possible variety of play. The ordinary course consists of either nine or eighteen holes from 100 to 500 yards apart. An ideal course is about 6000 yards long. The holes which mark the termination of a playing section consist of tin cans 4 inches in diameter

sunk into and flush with the level of the surrounding turf, which is called "the putting green." The game is played with a gutta-percha ball weighing about $1\frac{3}{4}$ ounces and with a set of "clubs" of various odd shapes and for making shots under various conditions. Usually a boy accompanies each player to carry his clubs. Such boys are called "caddies." The clubs are peculiarly named and it is optional with each player to have as many clubs as he desires. Some of the more common ones are called "driver," "brassie," "cleek," "iron," mashie," "niblick," "putter," and "lofting iron."

The game, which may be played by either two or four players, consists in endeavouring to drive the ball over the entire course from hole to hole in the fewest possible number of strokes. At the start a player takes his position on what is called the "teeing ground" and drives the ball in the direction of the first hole, the position of which is shown in the distance by a flag or tin sign with a number. Before driving he is privileged to place the ball on a tiny mound of earth or sand which is called a "tee." The players drive in order and then continue making shots toward the hole until finally they have all "holed out" by

"putting" their balls into the hole, and the lowest score wins the hole.

Golf is a game in which form is more essential than physical strength and which is adapted for elderly people as well as the young. The wooden clubs are usually made with either dogwood or persimmon heads and with split hickory handles or shafts. The handles are usually wound with a leather grip. Golf clubs of good quality will cost from two to three dollars apiece and a set for most purposes will consist of four to six clubs. The caddy bag to carry the clubs is made of canvas or leather and will cost from two dollars up. Standard quality golf balls will cost about nine dollars a dozen. Almost any loose-fitting outdoor costume is suitable for playing golf and the tendency in recent years is to wear long trousers in preference to what are known as "golf trousers."

A golf course — sometimes called a "links," from a Scotch word meaning a flat stretch of ground near the seashore — should be kept in good condition in order to enjoy the game properly. The leading golf clubs maintain a large force of men who are constantly cutting the grass, repairing damages to the turf, and rolling the greens. For this reason it is a game only adapted to club control unless one is

very wealthy and can afford to maintain private links.

GOLF-CROQUET

This game may be played either by two or four persons. Wickets are placed at irregular distances, and the object of the game is to drive a wooden ball $2\frac{3}{4}$ inches in diameter through these wickets. It may be played either as "all strokes," in which the total number of strokes to get through all the wickets is the final score, or as in golf, "all wickets," in which the score for each wicket is taken separately, as each hole in golf is played. The mallet used is somewhat different from a croquet mallet. The handle is longer and a bevel is made on one end to raise or "loft" the ball as in golf.

The size of a golf-croquet course will depend upon the field available. A field 200 yards long will make a good six-wicket course.

HAB-ENIHAN

This game is played with smooth stones about the size of a butter dish. A target is marked on the sand or on any smooth piece of ground, or if played on the grass the target must be marked with lime similar to marks on a tennis court. The outside

circle of the target should be six feet in diameter, and every six inches another circle described with a piece of string and two pegs for a compass.

The object of the game is to stand at a stated distance from the "enihan," or target, and to toss the "habs" as in the game of quoits. The player getting the best score counting from the inside ring or bull's-eye wins the game.

HALEY OVER

The players, equally divided, take positions on opposite sides of a building such as a barn, so that they can not be seen by their opponents. A player on one side then throws the ball over the roof and one of his opponents attempts to catch it and to rush around the corner of the building and throw it at one of the opposing side. If he succeeds, the one hit is a prisoner of war and must go over to the other side. The game continues until all of one side are captured.

HAND BALL

A game of ancient Irish origin which is much played by baseball players and other athletes to keep in good condition during the winter when most outdoor sports are impossible.

A regulation hand ball court has a back wall 30

feet high and 50 feet wide. Each game consists of twenty-one "aces." The ball is 1⅞ inches in diameter and weighs 1⅝ ounces. The ball is served and returned against the playing wall just as in many of the other indoor games and is similar in principle to squash and rackets.

HAND POLO

A game played with a tennis ball in which two opposing sides of six players each endeavour to score goals by striking the ball with the hands. The ball must be struck with the open hand. In play, the contestants oppose each other by shouldering and bucking and in this way the game can be made a dangerous one.

The goal is made into a cage form 3 feet 6 inches square. At the beginning of the game the ball is placed in the centre of the playing surface and the players rush for it. The umpire in hand polo is a very important official and calls all fouls, such as tripping, catching, holding, kicking, pushing, or throwing an opponent. Three fouls will count as a goal for the opponents.

HAND TENNIS

A game of lawn tennis is which the hand is used in place of a racket. A hand tennis court is smaller

than a regulation tennis court. Its dimensions are 40 feet long and 16 feet wide. The net is 2 feet high. The server is called the "hand in" and his opponent the "hand out." A player first scoring twenty-five points wins the game. A player can only score when he is the server.

A foul line is drawn 3 feet on each side of the net, inside of which play is not allowed. In all essential particulars of the rules the game is similar to lawn tennis.

HAT BALL

This game is very similar to Roley Boley or Nigger Baby except that hats are used instead of hollows in the ground. The ball is tossed to the hats and the first boy to get five stones, or "babies," in his hat has to crawl through the legs of his opponents and submit to the punishment of being paddled.

HIGH KICK

A tin pan or wooden disk is suspended from a frame by means of a string and the contestants in turn kick it as it is drawn higher and higher until finally, as in high jumping, it reaches a point

where the survivor alone succeeds in touching it with his toe.

HOCKEY

Hockey is usually played on the ice by players on skates, although, like the old game of shinney, it may be played on any level piece of ground. The hockey stick is a curved piece of Canadian rock elm with a flat blade. Instead of a ball the modern game of ice hockey is played with a rubber disk called a "puck." In hockey, as in many other games, the whole object is to drive the puck into your opponents' goal and to prevent them from driving it into yours. Almost any number of boys can play hockey, but a modern team consists of five players. Hockey skates are of special construction with long flat blades attached to the shoes. The standard length of blade is from 14½ to 15½ inches. They cost from three to six dollars. The hockey player's uniform is a jersey, either padded trousers or tights, depending upon his position, and padded shin guards for the goal tenders.

HOP OVER

All but one of the players, form a ring standing about two feet apart. Then by some "counting out"

rhyme some one is made "it." He then takes his place in the centre of the circle, holding a piece of stout string on the end of which is tied a small weight or a book. He whirls the string about and tries to strike the feet or ankles of some one in the circle, who must hop quickly as the string comes near him. If he fails to "hop over" he becomes "it."

HOP SCOTCH

Hop scotch is a game that is played by children all over the world. A court about 20 feet long and 4 or 5 feet wide is drawn with chalk, coal, or a piece of soft brick on the sidewalk or scratched with a pointed stick on a piece of level ground. A line called the "taw line" is drawn a short distance from the court. The court is divided into various rectangles, usually eleven divisions, although this varies in different sections. At the end of the court a half circle is drawn, variously called the "cat's cradle," "pot," or "plum pudding." The players decide who is to be first, second, etc., and a flat stone or piece of broken crockery or sometimes a folded piece of tin is placed in division No. 1. The stone is called "potsherd." The object of the game is to hop on one foot and to shoot the potsherd in and out of the court through the various divisions until they are

all played. He then hops and straddles through the court. Whenever he fails to do the required thing the next player takes his turn.

HUNT THE SHEEP

Two captains are chosen and the players divided into equal sides. One side stays in the home goal and the other side finds a hiding place. The captain of the side that is hidden or "out" then goes back to the other side and they march in a straight line to find the hidden sheep. When they approach the hiding place their own captain shouts, "Apple!" which is a warning that danger is near. When he is sure of their capture or discovery he shouts, "Run, sheep, run!" and all the party make a dash for the goal.

INTERCOLLEGIATE AMATEUR ATHLETIC ASSOCIATION OF AMERICA

This association controls the field athletic contests between the colleges known as the "Intercollegiates."

It is generally known as the I. C. A. A. A. A. To win a point for one's college in this contest is the highest honour that a track athlete may obtain.

In these games, which take place annually, the following thirteen events are contested for:

Mile run	Two-mile run
Shotput	880-yard run
440-yard run	220-yard low hurdles
120-yard hardles	Pole vault
100-yard dash	Broad jump
Running high jump	220-yard dash
Hammer throw	

I SPY

This game is sometimes called "Hide and Seek." One of the players is made "it" by any of the familiar counting-out rhymes. The rest then secure a hiding place while he counts fifty or one hundred. A certain tree or fence corner is considered "home." "It" then attempts to spy his hidden playmates in their hiding places and to run "home" shouting, "I spy" and their names. If the one discovered can get home before "it," he does so, shouting, "In free!" with all the breath that is left in him. The game is especially interesting just at dusk, when the uncertain light makes the "outs" brave in approaching home without detection. If "it" succeeds in capturing all the

players the first one caught is "it" for the next game.

JACK FAGOTS

This game is the same in principle as Jackstraws except that fagots or sticks of wood two feet long are used in place of jackstraws. They are removed from a pile with a crooked stick and must be taken out one at a time without disturbing the rest. The number of sticks removed constitutes a player's score. When any stick other than the one he is trying for is moved he loses his turn. The next player must attempt to remove the same stick that the other failed on. The game is won by the player having the greatest number of sticks to his credit.

JAPANESE FAN BALL

This game is especially adapted for a lawn party for girls. Either Japanese fans or the ordinary palm-leaf fans will do for rackets. The balls are made of paper and should be six or eight inches in diameter and in various colours. At opposite ends of a space about the size of a tennis court are erected goal-posts similar to those used in football, but only six feet above ground. These may be made of light

strips of wood. There is also a similar pair of posts and a crossbar midway between the goals.

The game is played by two contestants at a time. Each takes an opposite end of the court and tosses the ball into the air. Then by vigorous fanning she endeavours to keep it aloft and to drive it over the opponent's goal-post. At the middle posts the ball must be "fanned" under the crossbar. If the ball falls to the ground it may be picked up on the fan and tossed aloft again, but it must not be touched by the hands. The winner is the one who first drives the ball the length of the court and over the crossbar.

KICK THE STICK

One player is chosen to be "it" and the rest are given a count of twenty-five or fifty to hide. A stick is leaned against a tree or wall and this is the home goal. As soon as the goal keeper can spy one of the players he runs in and touches the stick and makes a prisoner, who must come in and stand behind the stick. If one of the free players can run in and kick the stick before the goal tender touches it, he frees all the rest and they scurry to a place of hiding before the stick can again be set up and the count of twenty-five made. As the object of the game is to free your fellow-prisoners, the free players

will attempt all sorts of ruses to approach the stick without being seen or to make a dash for it in hope of kicking it ahead of the goal keeper. The game is over when all the players are captured, and the first prisoner is "it" for the next game.

KING OF THE CASTLE

This can be made a very rough game, as it simply consists in a player taking a position on a mound or hillock and defying any one to dislodge him from his position by the taunting words:

"I'm the King of the Castle,
Get down you cowardly rascal."

The rest try to shove him from his position and to hold it successfully against all comers themselves. The game, if played fairly, simply consists in fair pulls and pushes without grasping clothing, but if played roughly it is almost a "free-for-all" fight.

LACROSSE

A game of ball played by two opposing teams of twelve players each. The lacrosse field is a level piece of ground with net or wire goals at each end. The players strive to hurl the ball into their opponents' goal by means of a lacrosse stick or "crosse." This is a peculiar bent stick with a shallow gut net at

one end. It somewhat resembles a tennis racket, but is more like a snowshoe with a handle. The game originated with the Indians and is much played in Canada.

In playing, the ball must not be touched with the hands, but is hurled from one player to another by the "lacrosses" until it is possible to attempt for a goal. It is also passed when a player is in danger of losing the ball.

Lacrosse sticks cost from two to five dollars each and are made of hickory with rawhide strings. The players wear specially padded gloves to protect the knuckles. The usual uniform for lacrosse is a tight-fitting jersey and running trousers.

LAWN BOWLS

This is a very old game and of great historic importance. The famous Bowling Green in New York City was named from a small park where the game was played by New Yorkers before the Revolution. The game is played with wooden balls five inches in diameter and painted in various gay colours. Usually lignum vitæ is the material used, They are not perfectly round but either slightly flattened at the poles into an "oblate spheroid" or made into an oval something like a modern football. Each player uses two balls, which are numbered.

A white ball, called a "jack ball," is then thrown or placed at the end of the bowling green or lawn and the players in turn deliver their balls or "bowl" toward the jack. The whole game consists in placing your ball as near to the jack as possible and of knocking away the balls of your opponents. It is also possible to strike the jack and to drive it nearer to where the balls of your side are lying. When all the players have bowled, the two balls nearest the jack each count a point for the side owning it. The game if played by sides is somewhat different from a two-handed contest. The main point first is to deliver the ball as near to the jack as possible and then to form a barrier or "guard" behind it with succeeding balls to block those of your adversaries. Sometimes the Jack is placed in the middle of the green and the teams face each other and bowl from opposite ends. A green is about seventy feet square with closely cropped grass. Four players form a "rink" and are named "leader," "second," "third," and "skip," or captain. The position from which the balls are delivered is called the "footer." It is usually a piece of cloth or canvas three feet square.

LAWN BOWLING

This game is similar in every respect to indoor bowling except that no regular alley is used. A net

for a backstop is necessary. The pins are set upon a flat surface on a lawn and the players endeavour to knock down as many pins as possible in three attempts. The scoring is the same as in indoor bowling. To knock down all ten pins with one ball is called a "strike," in two attempts it is a "spare." In the score, the strike counts ten for the player and in addition also whatever he gets on the next two balls. Likewise he will count ten for a spare, but only what he gets on one ball for a bonus. As a consequence the maximum or perfect score in bowling is 300, which is a series of ten strikes and two more attempts in which he knocks down all the pins. In lawn bowling the scores are very low as compared with the indoor game, where good players will often average close to 200 on alleys where they are accustomed to bowl. Lawn bowling is a different game from lawn bowls, which is described in a preceding paragraph.

LAWN HOCKEY

This game is played on a field a little smaller than a football field, being 110 yards long and from 50 to 60 yards wide. The ball used is an ordinary cricket ball. The goals are two upright posts 12 feet apart and with a crossbar 7 feet from the ground.

Eleven men on a side constitute a full team, but the game may be played with a fewer number. The positions are known as three forwards, five rushes, two backs or guards, and the goal tender.

The object of the game is very simple, being to drive the ball between your opponents' goals. The ordinary ice hockey stick will be satisfactory to play with. The principal thing to remember in lawn hockey is not to commit a "foul," the penalty for which is a "free hit" at the ball by your opponents. It is a foul to raise the stick above the shoulders in making a stroke, to kick the ball (except for the goal tender), to play with the back of the stick, to hit the ball other than from right to left, and any form of rough play such as tripping, pushing, kicking, or striking.

Lawn hockey is an excellent game and is really the old game of "shinney" or "shinty" played scientifically and with definite rules.

LAWN SKITTLES

From a stout pole which is firmly fixed in the ground a heavy ball is suspended by means of a rope fastened to the top of the pole. Two flat pieces of stone or concrete are placed on opposite sides of the pole. The game is played with nine-

pins, which are set up on one stone, the player standing on the other and endeavouring by hurling the ball to strike down a maximum number of pins. Usually he has three chances and the number of pins knocked down constitutes his score.

LAWN TENNIS (SEE CHAPTER ON TENNIS)

A game of ball played on a level piece of ground, called a court, by two, three, or four persons. When two play the game is called "singles," and when four play it is called "doubles." The game is played with a rubber ball, and rackets made by stringing gut on a wooden frame. The dimensions of a tennis court are 36 by 78 feet. In addition to this, space must be allowed for the players to run back, and it is customary to lay out a court at least 50 by 100 feet to give plenty of playing space. The court is divided into various lines, either by means of lime applied with a brush or by tapes. Midway between the two rear lines and in the centre of the court a net is stretched, supported by posts.

In playing one of the players has the serve — that is, he attempts to strike the ball so that it will go over the net and into a specified space on the opposite side of the net. His opponent then attempts to return the serve — that is, to strike the ball either

on the fly or the first bound and knock it back over the net somewhere within the playing space as determined by the lines. In this way the ball is volleyed or knocked back and forth until one of the players fails either to return it over the net or into the required space. To fail in this counts his opponents a point. Four points constitute a game except where both sides have obtained three points, in which case one side to win must secure two points in succession.

The score is not counted as 1, 2, 3, and 4, but 15, 30, 40, game. When both sides are at 40 it is called "deuce." At this point a lead of two is necessary to win. The side winning one of the two points at this stage is said to have the "advantage," or, as it is expressed, "vantage in" or "vantage out," depending upon whether it is the side of the server or his opponents, the server's score always being called first.

A set of tennis consists of enough games to permit one side to win six, or if both are at five games won, to win two games over their opponents.

LAST TAG

There are a great many games of "tag" that are familiar to boys and girls. One of the common

games is "last tag," which simply means that a boy tags another and makes him "it" before leaving the party on his way home. It is the common boys' method of saying "good-bye" when leaving school for home. The principal rule of last tag is that there is "no tagging back." The boy who is "it" must not attempt to tag the one who tagged him, but must run after some one else. It is a point of honour with a boy not to be left with "last tag" against him, but he must try to run some one else down, when he is then immune and can watch the game in safety, or can leave for home with no blot on his escutcheon.

LUGE-ING

A form of coasting very much practised in Switzerland at the winter resorts where the sled used is similar to our American child's sled with open framework instead of a toboggan or the more modern flexible flyer which is generally used by boys in America.

MARATHON RACE

A long distance race, held in connection with the Olympic Games and named from a famous event in Greek history. The accepted Marathon distance is 26

miles, 385 yards. The race was won at the Olympic Games held in England in 1908 by John Hayes, an American, in 2 hours 44 minutes 20 2-5 seconds.

OLYMPIC GAMES

The Olympic Games are open to the athletes of the world. The following events are contested for:

60-metre run
100-metre run
200-metre run
400-metre run
800-metre run
1500-metre run
110-metre hurdles
200-metre hurdles
400-metre hurdles
3200-metre steeplechase
2500-metre steeplechase
4000-metre steeplechase
Running long jump
Running high jump
Running triple jump
Standing broad jump
Standing high jump
Standing triple jump
Pole vault
Shot put
Discus throwing
Throwing 16-pound hammer
Throwing 56-pound weight
Marathon race
Weight lifting, one hand
Weight lifting, two hands
Dumb-bell competition
Tug-of-war
Team race
Team race 3 miles
Five-mile run
Throwing stone
Throwing javelin
Throwing javelin held in middle
Penthathlon
1500-metre walk
3500-metre walk
10-mile walk
Throwing discus Greek style

MARBLES

There is a large variety of games with marbles and the expressions used are universal. Boys

usually have one shooter made from agate which they call a "real." To change the position of the shooter is called "roundings," and to object to this or to any other play is expressed by the word "fen." The common game of marbles is to make a rectangular ring and to shoot from a line and endeavour to knock the marbles or "mibs" of one's opponents out of the square. A similar game is to place all the mibs in a line in an oval and to roll the shooter from a distance. The one coming nearest to the oval has "first shot" and continues to shoot as long as he drives out a marble and "sticks" in the oval himself. Reals are often supposed to have superior sticking qualities. Playing marbles "for keeps" is really gambling and should be discouraged. The knuckle dabster is a small piece of cloth or leather that boys use to rest the hand on when in the act of shooting. The best kind of a "dabster" is made from a mole's skin.

NAMES OF MARBLES

The common marbles used by boys everywhere are called mibs, fivers, commies, migs, megs, alleys, and dubs. A very large marble is a bumbo and a very small one a peawee. Glass marbles are called crystals and those made of agate are called reals.

The choicest real is supposed to be green and is called a "mossie" or "moss real."

MUMBLETY PEG

This game is played with a penknife. A piece of turf is usually the best place to play. Various positions for throwing the knife are tried by each player, following a regular order of procedure, until he misses, when the knife is surrendered to the next in turn. When he receives the knife each player tries the feat at which he failed before. The last player to accomplish all the feats has the pleasure of "pulling the peg." The peg consists of a wedge-shaped piece of wood the length of the knife blade which is driven into the ground by the back of the knife and must be pulled by the teeth of the unfortunate one who was last to complete the necessary feats. The winner has the honour of driving the peg, usually three blows with his eyes open and three with them closed. If he succeeds in driving it out of sight the feat is considered especially creditable and the loser is greeted with the cry, "Root! Root!" which means that he must remove the sod and earth with his teeth before he can get a grip on the peg top. There are about twenty-four feats or "figures" to be gone through in a game of mumblety peg,

throwing the knife from various positions both right and left handed. In each feat the successful result is measured by having the knife stick into the ground at such an angle so that there is room for two fingers to be inserted under the end of the handle without disturbing the knife.

ONE OLD CAT

This is a modified game of baseball that may be played by three or four. Generally there is only one base to run to, and besides the batter, pitcher, and catcher the rest of the players are fielders. Any one catching a fly ball puts the batter out and takes his turn at bat, or in another modification of the game, when one is put out each player advances a step nearer to batsman's position, the pitcher going in to bat, the catcher becoming pitcher, first fielder becoming catcher, and so on, the batsman becoming "last fielder."

PASS IT

This game may be played on a lawn. Four clothes baskets are required as well as a variety of objects of various sizes and kinds, such as spools of thread, pillows, books, matches, balls, pencils, umbrellas, pins, and so on. Two captains are chosen and each selects a team, which stands in line facing each other.

Two of the baskets are filled with the various articles and these two baskets are placed at the right hand of the two captains. The empty baskets are on the opposite ends of the line. At a signal the captains select an object and pass it to the next in line. He in turn passes it to his left and finally it is dropped into the empty basket. If the object should be dropped in transit it must go back to the captain and be passed down the line again. Two umpires are desirable, who can report the progress of the game to their own side as well as keep an eye on their opponents.

PELOTA

A game similar to racquets, sometimes called "Jai-a-li," that is much played in Spain and in Mexico. The game is played with a narrow scoop-like wicker basket or racket which is fastened to the wrist. The players catch the ball in this device and hurl it with terrific force against the wall of the court. Pelota is a hard, fast game, and sometimes serious injuries result from playing it.

PLUG IN THE RING

This is the universal game that boys play with tops. A ring six feet in diameter is described on the ground and each player puts a top called a "bait"

in the centre. The baits are usually tops of little value. The "plugger," however, is the top used to shoot with and as a rule is the boy's choicest one. As soon as the players can wind their tops they stand with their toes on the line and endeavour to strike one of the baits in such a way as to knock it out of the circle and still leave their own tops within the circle and spinning. If they miss, the top must be left spinning until it "dies." If it fails to roll out of the ring, the owner must place another bait top in the ring, but if it leaves the circle he may continue shooting. It is possible to play tops for "keeps," but, like marbles for "keeps," it should be discouraged, as it is gambling.

POLO OR EQUESTRIAN POLO

A game played on horseback, which originated in Eastern countries and was first played by the English in India. It has been introduced both into England and America. Polo is a rich man's game and requires a great deal of skill in horsemanship as well as nerve. A polo team consists of four men, each of whom must have a stable of several horses. These horses, or "polo ponies," are trained carefully, and a well-trained pony is as essential to good playing as a skilful rider.

The game is played with a mallet, the head of

which is usually ash, dogwood, or persimmon, and has a handle about 50 inches long. The ball is either willow or basswood. The principle of the game is similar to nearly all of the outdoor games played with a ball: that of driving it into the opponents' goal, meanwhile preventing them from making a score on one's own goal.

POTATO RACE

In this game as many rows of potatoes are laid as there are players. They should be placed about five feet apart. The race consists in picking up all of the potatoes, one at a time, and carrying them to the starting point, making a separate trip for each potato. At the end of the line there should be a basket or butter tub to drop them into. The game is sometimes made more difficult by forcing the contestants to carry the potatoes on a teaspoon.

PRISONER'S BASE

Two captains select sides. They then mark out on the ground two bases, or homes. They also mark out two "prisons" near each home base. Then each side stands in its own home and a player runs out and advances toward the enemy's home. One of the enemy will then run out and endeavour to tag him before he can run back to his own base,

and one of his side will try to tag the enemy, the rule being that each in turn must have left his home after his opponent. If a player is tagged, he becomes a prisoner of the other side and is put into the prison. The successful tagger may then return to his home without danger of being tagged. A prisoner may be rescued at any time if one of his side can elude the opponents and tag him free from prison. The game ends when all of one side are made prisoners.

PUSH BALL

A game usually played on foot but sometimes on horseback, in which the object is to push or force a huge ball over the opponents' goal line. A regulation "push ball" is six feet in diameter and costs three hundred dollars.

In push ball almost any number may play, but as weight counts, the sides should be divided as evenly as possible.

QUOITS

A game played with flattish malleable iron or rubber rings about nine inches in diameter and convex on the upper side, which the players endeavour to loss or pitch so that they will encircle a pin or

peg driven into the ground, or to come nearer to this peg than their opponents. The peg is called a "hob." A certain form of quoits is played with horseshoes throughout the country districts of America. A quoit player endeavours to give the quoit such a position in mid-air that it will not roll but will cut into the ground at the point where it lands. The game is remotely similar to the ancient Greek game of throwing the discus. Iron quoits may be purchased for a dollar a set.

The average weight of the quoits used by experts is from seven to nine pounds each. Sixty-one points constitute a game. The distance from the peg shall be either 10, 15 or 18 yards. For a space three feet around the pin or peg the ground should be clay. In match games, all quoits that fall outside a radius of 18 inches from the centre of the pin are "foul," and do not count in the score.

RACQUETS OR RACKETS

One of the numerous court games similar to lawn tennis that is now finding public favour, but played in a semi-indoor court. A racquet court is 31 feet 6 inches wide and about 63 feet long. The front wall, against which the ball is served, has a line 8 or 10 feet from the floor, above which the ball

must strike. The server, as in tennis, takes his position in a service box with a racket similar to a lawn tennis racket except that it has a smaller head and a longer handle.

Either two or four players may play racquets. A game consists of fifteen "aces," or points.

RED LINE

In this game, also called Red Lion, the goal must be a straight line, such as the crack in a sidewalk or the edge of a road. The one who is "it" runs after the rest as in tag, and when he has captured a prisoner he brings him into the "red line," and the two start out again hand in hand and another is captured, then three together, and two pair, and so on until all are prisoners. The first prisoner is "it" for the next game.

ROLEY BOLEY

This game is also called Roll Ball and Nigger Baby, and is played by children all over the civilized world. A number of depressions are hollowed in the ground corresponding to the number of players and a hole is chosen by each one. A rubber ball is then rolled toward the holes, and if it lodges in one of them the boy who has claimed that hole

must run in and pick up the ball while the rest scatter. He then attempts to hit one of the other players with the ball. If he succeeds a small stone called a "baby" is placed in the hole belonging to the boy struck. Otherwise the thrower is penalized with a "baby." When any boy has five babies he must stand against the wall and be a free target for the rest to throw the ball at.

ROQUE

This game may be called scientific croquet. A roque mallet has a dogwood head 9½ inches long, with heavy nickel ferrules. Roque balls are made of a special composition that is both resilient and practically unbreakable.

A skilful roque player is able to make shots similar to billiard shots. The standard roque court is 60 feet long, 30 feet wide, with corner pieces 6 feet long. The playing ground is of clay and should be as smooth as it is possible to make it. A very light top dressing of sand is used on the clay. The wickets, or "arches," are driven into blocks of wood to secure firmness and buried into the ground with the top of the arch 8 inches above the surface.

The roque balls are 3¼ inches in diameter and the arches only 3½ wide, which gives an idea of

the difficulty of playing this game. To be an expert requires an accurate eye and a great deal of practice.

There is a National Roque Association, and an annual championship tournament is held to determine the champion. The home of roque is in the New England States.

ROWING RECORD

The best amateur intercollegiate record for the eight-oared race of four miles is 18 minutes $53\frac{1}{5}$ seconds, made by Cornell, July 2, 1901.

RUBICON

This game may be played with any number of players, and is especially adapted for a school or lawn game. Two players are chosen as pursuers and the rest are divided equally and stand two by two facing each other in two columns. The two pursuers stand at the head of each column and face each other. When ready they say, "Cross the Rubicon," and at this signal the rear couple from each line must run forward and try to reach the rear of the other line. The pursuers must not look back, but as soon as the runners are abreast of them must try to tag them before they reach the place of safety. The captured runners become

pursuers, and the one who was "it" takes his or her place at the rear of the other line.

SACK RACING

A form of sport where the contestants are fastened in sacks with the hands and feet confined and where they race for a goal by jumping or hopping along at the greatest possible speed under this handicap. A sack race should not be considered one of the scientific branches of sport, but is rather to afford amusement for the spectators.

SCOTLAND'S BURNING

This game is based upon the song of the same name. The players form a ring, with three judges in the centre. Each player with appropriate gestures in turn begins the song,

> "*Scotland's burning. Scotland's burning,*
> *Look out! Look out!*
> *Fire! Fire! Fire! Fire!*
> *Pour on water! Pour on water!*"

The whole party are soon singing, but each four are singing different words. The object of the judges is to detect some one in the circle either making gestures that are not appropriate to the words or to be singing out of order. The penalty is to turn around and sing with the back to the

circle. The three who are facing in last then become judges.

SKIING

This sport has recently received wide popularity in sections of the country where the winters make it possible. Skis — or, as they are sometimes spelled, skee, — are a pair of flat runners from five to ten feet long which are attached to the feet in such a way as to be easily cast off in case of accident. By means of skis a ski-runner may either make rapid progress over level snow or may coast down sharp declivities and make jumps of great extent.

Skis are usually made of ash and the standard lengths are from six to eight feet. They cost from five to seven dollars a pair. In skiing it is customary to use a pair of steel-shod poles with leather wrist straps, but in ski-running or coasting the use of poles is very dangerous.

SPANISH FLY

In this game of leap frog various tricks are attempted by the leader, as in the game of "stump master." Each of the boys following is expected to do as the leader or to drop out and become "down" himself. "Torchlight" is to jump with

one hand only, using the other to wave his cap as if it were a torch. In "hats on deck" each jumper in turn is supposed to leave his cap on "down's" back. Naturally the last one over may have a large pile of hats to clear. If he disturbs any of them or knocks them off, he is "it." "Hats off" means for each jumper in turn to take his own hat without knocking off any of the others. In all games of leap frog it is considered proper for the jumper to direct "down" to give him the kind of a "back" he desires. Consequently he will say high or low back, depending upon whether he wishes "down" to stand almost upright or to bend close to the ground.

SQUASH

This game is similar to racquets, but is less violent or severe on a player. It is played in a court 31 feet 6 inches wide. The front wall must be 16 feet high. The service line above which the ball must strike on the serve is 6 feet from the floor. Below this line and 2 feet from the floor is the "tell tale," above which the ball must strike in play. A squash racket is similar to a tennis racket, but slightly smaller.

In squash, a game is "fifteen up." At the score

of 13 a player may "set the score" back to 3 or 5, after which the player first winning either 3 or 5 points, or aces, as they are called, is the winner. The object of this is to endeavour to overcome the advantage that the server may have.

In a regulation squash court the spectators' gallery is above the walls of the court, and the game is played in the pit below the gallery.

STUMP MASTER

In this game one of the players is chosen master. It is usually the one who first suggests the game by saying, "Let's play stump master." He then leads the line of players, going through various "stumps," or, as we should call them now, "stunts," such as climbing fences and trees, turning somersaults, crawling through narrow places, or whatever will be difficult for the rest to copy. The game is capable of all sorts of variations.

SUCKERS

This can scarcely be called a game, but the use of the sucker is so familiar to most boys that a description of it is surely not out of place in this chapter. A piece of sole leather is used, three or four inches square. It is cut into a circle and the

edges carefully pared thin. A hole is made in the centre and a piece of string or top twine is knotted and run through the hole. The sucker is then soaked in water until it is soft and pliable. The object of the sucker is to lift stones or bricks with it. This, too, is of especial interest in New England towns, where there are brick sidewalks. The sucker is pressed firmly on a brick by means of the foot, and it will be found to adhere to it with sufficient force to lift it clear of the ground.

TETHER BALL

The same as tether tennis, which see.

TETHER TENNIS

This game has been developed out of lawn tennis. A wooden pole extending 10 feet above the surface is placed in a vertical position and firmly imbedded in the ground. The pole must be 7½ inches in circumference at the ground and may taper to the top. Six feet above the ground a black band 2 inches wide is painted around the pole. The court is a smooth piece of sod or clay similar to a tennis court, but a piece of ground 20 feet square is sufficient.

At the base of the pole a circle is described with a 3-foot radius. A line 20 feet long bisects this circle, and 6 feet from the pole on each side are two crosses, which are known as service crosses.

An ordinary tennis ball is used which has been fitted with a tight-fitting linen cover. The ball is fastened to the pole by means of a piece of heavy braided line. Ordinary heavy fish line will do. The ball should hang 7½ feet from the top of the pole or 2½ feet from the ground. Regulation tennis rackets are used.

The game consists in endeavouring to wind the ball and string around the pole above the black mark in a direction previously determined. The opponent meanwhile tries to prevent this and to wind the ball in the opposite direction by striking it as one would volley in tennis.

Each player must keep in his own court. The points are scored as "fouls." Eleven games constitute a set. A game is won when the string is completely wound around the pole above the black mark. The penalty for a foul, such as stepping outside of one's court, allowing the string to wind around the handle of the racket or around the pole

below the black mark, provides for a free hit by one's opponent.

THREE-LEGGED RACING

A race in which the contestants are paired off by being strapped together at the ankles and thighs. Remarkable speed can be obtained by practice under this handicap. There are definite rules to govern three-legged races, and official harness may be bought from sporting goods outfitters. As a race, however, it is like sack racing, to be classed among the sports designed to afford amusement rather than as a display of skill.

TUB RACING

These races are often held in shallow lakes. Each contestant sits in a wash tub, and by using his hands as paddles endeavours to paddle the course first. As a wash tub is not a particularly seaworthy craft, and spills are of frequent occurrence, it is well for the tub racers also to know how to swim.

VOLLEY BALL

This game is extremely simple and may be played by any number of players, provided that there is space and that the sides are evenly divided. The best dimensions for a volley ball court are 25 feet wide and 50 feet long, but any square space evenly

divided into two courts will do. The game consists of twenty-one points.

The ball is made of white leather and inflated with a rubber bladder. A net divides the two courts and is 7 feet high. The standard volley ball is 27 inches in circumference and weighs between 9 and 12 ounces.

The whole object of the game is to pass the ball back and forth over the net without permitting it to touch the floor or to bound. In this way it somewhat resembles both tennis and hand ball.

Volley ball is an excellent game for gymnasiums and has the decided advantage of permitting almost any number to play.

WARNING

The "warner" takes his position at a space called "home" and the rest of the players stand some distance from him. He then clasps his hands and runs out, trying to tag an opponent with his clasped hands. This would be practically impossible except that the players endeavour to make him unclasp his hands by pulling at his arms and drawing temptingly near him. As soon as he has tagged a victim he runs for home as fast as possible. If he himself is tagged before he reaches home he is out, and the

tagger becomes "warner." If both the warner and the one tagged reach home safely they clasp hands, and finally the line contains all the players but one, who has the honour of being warner for the next game. The game receives its name from the call, "Warning!" which the warner gives three times before leaving home.

WASHINGTON

In this game a player stands blindfolded and another player comes up and taps him. The one who is "it" then gives a penalty, such as "climb a tree or run to the corner and back," and then tries to guess who it was that tapped him. The one tapped must answer some question so that he may be recognized by his voice or laugh. If "it" is correct in his guess, the player must do as directed, but if his guess is wrong he must do it himself. The result of this game is that the blindfolded player will measure the severity of his "forfeits," or "penalties," to his certainty of guessing correctly the name of the player.

WATER POLO

This game is played in a swimming pool. A white ball made of rubber fabric is used. The ball must

be between 7 and 8 inches in diameter. The goals are spaces 4 feet long and 12 inches wide at each end of the tank and placed 18 inches above the water line. Six men on a side constitute a team.

It is a game in which skill in swimming is absolutely essential. It is also a very rough game. The player endeavours to score goals by swimming with the ball, and his opponents are privileged to tackle him and to force him under water or in other ways to attempt to secure the ball from him. Meanwhile the other players are blocking off opponents, and in general the game resembles a football game in its rudiments.

WATER RACE

In this game the contestants run a race carrying a glass or tin cup full of water on top of the head, which must not be touched by the hands. The one finishing first with a minimum loss of water from his cup is the winner.

WICKET POLO

A game played by two teams of four players each. The ball used is a regulation polo ball. A wicket polo surface is 44 feet square, in which sticks or wickets are set up. The object of the game is to

knock down the wickets of one's opponents by a batted ball and to prevent them from displacing our own. A crooked stick 4 feet in length and a little over an inch in diameter is used. Each player has a fixed position on the field or surface.

WOLF AND SHEEP

In this game "it" is the wolf. The sheep choose a shepherd to guard them. The wolf then secures a hiding place and the sheep and shepherd leave the fold and endeavour to locate him. When this is done the shepherd cries, "I spy a wolf!" and every one stands while he counts ten. Then the sheep and shepherd scatter for the fold, and if tagged before they reach it the first becomes wolf for the next game.

WOOD TAG

In this class are also "iron tag," "stone tag," and "tree tag." They are all simply the game of tag with the additional rule that when a player is in contact with iron, stone, trees, wood, and so on he is safe from being tagged by the one who is "it." The game of "squat tag" is similar, except that to be safe the one pursued must squat quickly on the ground before "it" catches him. In cross tag,

"it" must select a victim and continue to run after him until some one runs ahead and crosses his path, when "it," who may be breathless by this time, must abandon his victim for a fresh one, who may soon be relieved and so on until some one is tagged, or "it" is exhausted.

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